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The Growth and Development of Sheffield's Industrial
Structure, 1880-1930.

by

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A thesis submitted to the Council for National
Academic Awards in partial fulfilment of the
requirements for the degree of Doctor of Philosophy.

Sponsoring Establishment: Department of Historical &
Critical Studies, Sheffield City
Polytechnic.

Collaborating Establishment: The Sheffield Trades Historical
Society.

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ABSTRACT

The Growth and Development of Sheffield's Industrial Structure, 1880-1930

by

M.J. Levis

Sheffield presents an ideal location for a study of the structure and performance of a major industrial sector, iron and steel, in the crucial years 1880-1930. The major emphasis of this work is on the structure and strategy of Sheffield's industries which faced increasing competitive constraints in this period. Thus, the response of the firm to change is examined by studying business development both from the point of view of individual firms and from the view of firms as part of a wider business system. The former is achieved by developing a theory of business strategy which aids the understanding of managerial decision making and the internal and external constraints on development. The latter, however, requires a reconstruction of Sheffield's iron and steel industry, which is undertaken for the period 1880-1901, and identifies the structural characteristics of the industry. The retention of a structure of small-scale firms is clearly illustrated, especially in cutlery, and this in turn shaped the competitive strategy of the firm in relation to market and resource development. For example, the issue of managing the firm's labour input, in terms of a skilled workforce, was a key area for management, and this determined the type of product produced and the market strategy adopted, and ultimately the competitive success of the firm. Furthermore, the study of a key sector of the economy in this period lends itself to a broader analysis of British industrial development, with its emphasis on the alleged conservative response of British businessmen to increasing competitive constraints. On this last issue, there is a need to consider the political response of Sheffield's business community to issues such as protection, state intervention and rationalisation. Thus, a novel component of this work is to incorporate a political economy approach to business history, linking local industrial issues to the wider political environment in the period 1880-1930.

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Preface.

The decline of steel in the 1980's, especially in the Sheffield region, has witnessed the demise of a city which since the late eighteenth century had been at the forefront of that industry. However, the long term decline of Sheffield can be traced back to the period 1880-1930 when growing competition and economic depression put considerable pressure on business firms. The motivation underpinning this thesis is to study a crucial period in the industry's fortunes and to investigate the structure of the industry from both an economic and political standpoint. This work has been a long time in the making and needless to say a considerable academic debt has been accumulated. The two outstanding ones are firstly to Roger Lloyd-Jones, who stimulated my interest in the reconstruction of business systems and provided the theoretical and empirical expertise for our joint study of the Manchester economy in the early nineteenth century. Secondly, to L.J. Williams, who instilled a long-term interest in the steel industry and whose help and guidance in my years at UCW Aberystwyth were invaluable. As usual in an historical study, one relies on the help and goodwill of numerous archivists, and special thanks is due to David Postles and Richard Childs at the Archives Department, Sheffield Central Library. Finally, but not least, gratitude must be bestowed on those who have to put up with those obsessed with academic research, so a great debt is owed to my wife, Ishbel.

Introduction, A Theory Of Business Strategy.

Alford has claimed that there is a need to examine the role of the entrepreneur and the firm "within the broader context of the development of business structure and strategy,"[^] This thesis will explore the structural features of Sheffield's business system between 1880 and 1930 from the point of view of a theory of business strategy. It is not the intention to offer another history of the Sheffield steel industry,[^] but rather to concentrate on the properties and changing characteristics of a key industrial sector in a major industrial city, an area of the British economy which has come under increasing scrutiny by economic historians concerned with Britain's long-term industrial decline. The study of industrial structure requires an analysis of firm populations and the interconnections between business components both economically and politically. Furthermore, this study examines the response of business firms to the changing economic environment they faced, thus, as a starting point, we need to develop a theory of business strategy which will aid our understanding of the development of firms and business systems. Therefore, this work adopts a dual approach by studying business development both from the point of view of individual firms and from the view of firms as part of a wider business system.

As Ghannon claims, business historians "have been reluctant to generalise ... about broad trends in the

development of or managerial guidance of ... enterprise as a population" of firms. Thus we should view the firm "both as a totality and as a member of a population" of firms.^ Chapter 2 sets out the methodological framework for the reconstruction of Sheffield's business system c.1880-1901, and starts to explore the characteristics of the industrial sectors identified, especially the survival of small-scale firms. This then sets up the basis for exploring business strategy in following chapters. In particular, the cutlery trades demonstrate a system overwhelmingly confined to small, private, competing firms and the effects of this on business strategy are analysed in Chapters 4, 5 and 6. Essentially, it is argued that Sheffield's system was characterised by a process of uneven development in the light Sheffield trades. However, what are the theoretical parameters for studying business strategy?

According to Mathias, the decision to innovate and invest remain "in the hands of business firms" and "the more historians can learn about the evolution of the business firm and business systems the better."^ We thus need a clear conceptual idea of business strategy which will provide a framework for the analysis of firm behaviour. In particular, this will provide the theoretical base for exploring the business strategies devised by Sheffield firms^ in response to the changing economic environment they faced in the crucial years between 1880 and 1914. Thus, business strategy is perceived as a response mechanism both to internal constraints

within the firm and to external changes in the market configuration facing firms. For example, Chapter 3 examines the competitive constraints on Sheffield firms and considers the question of a crisis in the industry in the 1880's which placed increasing pressures on businessmen faced with change.

Certainly, recent contributions to the methodological debate in business history,^C have called for a greater symbiosis between economic theory and the historical context in which firms operate. Thus, the evolution of the firm should be examined in its historical setting, and appropriate economic theory applied to aid our understanding of business development. However, what economic theory should the business historian utilise, given that a great deal of such theory tends to be inappropriate for historical analysis? As Coleman points out, "Orthodox British economic theory, built upon the neo-classical synthesis and then from Keynesian and post-Keynesian macroeconomics, is simply of very little use to business historians." In terms of the neo-classical theory of the firm, Coleman emphasises that this is inappropriate for historical analysis, and "even when modified to take account of varying sorts of market imperfections, is not about firms as entities." Rather, it is concerned with the mechanisms of price adjustment for both commodities and productive factors "in various assumed conditions of competition." If the business historian is concerned with analysing changes in these parameters, then orthodox theory is perfectly acceptable, but for those

concerned with the growth and development of the firm as an historical process then this framework has its limitations.[^]

An alternative line of approach is therefore required and here the theory of business strategy, developed by Scott Moss,^{1^} will be explored and utilised. The value of this work to the business historian lies in the fact that Moss specifically locates firm theory within an historical context. The antecedents of this theory are to be found in the works of Chandler, Penrose, and Andrews, x who all integrate the theory of the firm with historical experience. Commenting on the contribution of these studies to our understanding of business history, Coleman claims that "all such work has an historical dimension in that it seeks to relate the firm's decision-making process over time to the frameworks of markets and institutions in which it takes place. What then is the theory of business strategy and how can it be applied to the historical evolution of the firm?

For Moss, the key role of the economic theory of business strategy, is to "identify the broad forces which constrain firms and which create business opportunities."[^] In turn, there is a need to specifically define the firm as an entity because the theory of business strategy "is largely about firms and the determinants of their growth and development." Moss, defines the firm as "a collection of productive resources with organisational structure." The productive resources of the firm, include both physical and human resources. In turn,

physical resources are defined as the firm's tangible assets, plant, equipment, stocks of raw materials, semi-finished and finished goods etc.; while human resources include the firm's endowment of skilled and unskilled labour, clerical, administrative, financial, legal, technical and managerial staff. It therefore follows that the firm's resource composition will essentially "determine the range of activities undertaken by the firm."¹

But what mechanism decides the appropriate resource mix of the firm? The coordination of these resources requires a central unifying principle which Moss identifies with the organisational structure of the firm. Thus, the organisational structure of the firm is the key to understanding how management delineates "responsibility for particular kinds of decisions" and directs various information flows.¹⁸ Therefore, the business historian needs to specify the organisational structure of the firm which "is not itself a resource but rather derives from the services ... rendered by the human and physical resources of the firm."¹ The heart of the organisational structure is the managerial team who effectively coordinate the activities of the firm and take "strategic decisions with regard to both investment strategies and competitive strategies."¹⁸ Organisation is therefore the key factor in understanding the process of business development, however, in the short-run the managerial resources of the firm may impose constraints on the growth and diversification of the

firm.^

Given the emphasis on the organisational structure, what is the composition of this structure? In other words, who are the economic actors who organise business decision making? Of course, the economic actor refers to the entrepreneur and the theory of entrepreneurship has fascinated economists and historians from Marshall and Schumpeter onwards. The entrepreneur is associated with the growth of the firm and the entrepreneurial role in economic development and as Loasby claims, "Entrepreneurship is connected with change" although "there are many kinds of change, and correspondingly many concepts of the entrepreneurial function. Thus the concept of the entrepreneur provides the business historian with a minefield of theoretical complexity. According to Gasson, there is a need to integrate both an indicative and functional analysis of entrepreneurship and provide some basic theoretical observations concerning entrepreneurial performance.^But what is the role of the entrepreneur?

An interesting functional definition of entrepreneurs, or top executives is provided by Chandler: "entrepreneurial decisions and actions refer to those which affect the allocation or re-allocation of the resources for the enterprise as a whole."^2 Similarly, Casson defines the entrepreneur as "someone who specialises in taking judgmental decisions about the coordination of scarce resources. Thus, the entrepreneur within the organisation is a functional specialist who

organises, controls, plans and coordinates the operations of the business enterprise.[^] However, as Gasson argues, managerial specialism is not necessarily identical to individual entrepreneurship, as functions can be delegated to managers, and therefore a further function of the entrepreneur is the ability to distribute *r e s p o n s i b i l i t y*.[^] Thus, as Hannah claims, in relation to the development of managerial structures in the inter-war years, "The proliferation of functional specialists was important"* because it allowed central management to delegate "routine" and "administrative*1 functions allowing the higher echelons of management to concentrate on planning, policy strategy and supervision of the various units of the firm.2°

To successfully perform these various functions, entrepreneurs must be endowed with specific indicative qualities. These range from a "self knowledge" of the principle objectives of the firm to imagination and foresight, practical knowledge of business constraints, analytical ability, computational and communication skills.[^] Thus, entrepreneurs have to identify the business opportunities and constraints facing the firm and to develop strategies to take advantage of or overcome these constraints. Furthermore, entrepreneurs may well not be endowed with all these qualities and therefore the ability to organise and delegate managerial responsibility is essential to the successful performance of the business firm.[^] As Alford points out, we need to consider the concept of

"diffused entrepreneurship"¹, a consequence of which "is that hardly anybody is acting as an entrepreneur all the time," Also, diffused entrepreneurship is entrepreneurship diluted with other business functions.[^] The integration of the indicative and functional approach to the question of entrepreneurship will provide a framework for assessing the contribution and function of business organisation in Sheffield's iron and steel sector.

Central to discussions on entrepreneurship are the motives underlying managerial decision making within the business organisation. Here again the theory of business strategy provides an analytical base for the business historian. Theories of managerial motivation are often postulated in terms of "a universal goal for managers"^{-^} ranging from neo-classical profit maximisation models to behavioural hypothesis concerned with growth, sales or utility as the principle target of entrepreneurial endeavour. However, as Moss points out, these are highly simplistic models of firm behaviour and "The cost of this simplicity is the heroic assumption that a single assumption can describe the hopes, desires and ambitions of all individuals in a wide variety of circumstances." Indeed, before these abstract criterion can be realised, the overriding objective of the firm is to survive. Neo-classical theory however, does not reflect the fact that the firm as a business entity "should survive a day longer than its ability to earn at least normal profits. Thus the notion of survival

is central to the formulation of economic strategy by the business organisation. For example the decision to expand and diversify business activities is related to the prime objective of survival in the face of the internal and external constraints facing the firm at a given moment in time.

Such a conclusion, relating as it does to the primary survival motive of the firm, would seem to be relevant to the analysis of the iron and steel industry in the period 1880 to 1914. Iron and steel firms were faced with increasing pressures to innovate and reorganise in the face of market, financial, resource development and technological constraints. Hyde, for example, referring to the period after 1850, claims that faced with a changing economic and technical environment, the iron master "made innovations to ensure his survival. This in turn reflects the indicative qualities of entrepreneurship; namely the ability to effectively identify and to develop policies to overcome such constraints. Thus, it will be argued that firms operate in an environment of constant change and are subject to both internal and external constraints. As Hartman and Wheeler point out, utilising a neo-Schumpeterian model, ^

The competitive environment in which firms operate is one of struggle and motion. It is a dynamic selection environment, not an equilibrium one. The essential forces of growth are innovation and selection, with augmentation of capital stocks more or less tied to the process. ^

Clearly the emphasis, as in Schumpeter's analysis, is on the innovating entrepreneur and decision making is conditioned by changes in the economic environment. As the authors note,

changes in the environment lead to changes in the "production rules" under which firms operate and the organisational structure^ of the business firm. Therefore, economic development is "promoted by repeated shifts in favour of firms whose decision rules are favourably attuned to the economic environment" and where entrepreneurial decision making is "crucial to the process.

The ability of the firm to tackle the constraints thrown up by a changing economic environment will in turn depend on Moss's notion of the organizational structure of the business enterprise. As Hannah claims, it was management that was the critical factor in the realisation of scale and market economies.^ Chandler's excellent work on the rise of managerial capitalism in American business enterprise^ reflects the importance of organisation to managerial success:

As long as an enterprise belonged in an industry whose markets, sources of raw materials, and production processes remained relatively unchanged few entrepreneurial decisions had to be reached. In that situation such a weakness (the centralised organisational structure) was not critical, but where technology, markets, and sources of supply were changing rapidly, the defects of such a structure becomes obvious. ^

Thus, as Marshall noted, the firm has to organise its production and marketing activities "in an environment of uncertainty and change.

Therefore, the organisational structure of the firm may well be crucial to the survival and continued prosperity of the business concern, in the face of changes in the constraints under which firms operate in the short-run. According to Moss,

the constraints will be enhanced when the firm faces growing competitive pressures. Such constraints are "conceptually, problems which arise in the day-to-day operations of the firm, and which cannot be handled within the routine procedures adopted for these operations." Constraint changes are associated with changes "in the conditions of supply of inputs (ie, factors of production) or increasing pressure on existing plant and equipment or the existing administrative structure of the firm. Furthermore, Moss argues that competitive pressures are associated with business uncertainty, which in turn is related to a "lack of information on the part of entrepreneurs. This uncertainty may well engender a degree of "inaction," excessive caution and entrenched conservatism by businessmen faced with change.^

Clearly then, the development of effective business information flows, both internally, between managers and departments within the organisation; and externally, between the firm, its agents, distributors and customers is a specific function of the organisational structure. As Casson argues, the market needs to be monitored and the firm requires product information, transactor information and contract information.^ The development of the firm's managerial resources devoted to exchange are considered in Chapters 5 and 6. The development of information flows is a key area of managerial decision making. Information is essentially an economic commodity, defined as a "satiation good."^ Thus the firm can be inundated with too

much information, and the role of management is to develop systems which prioritise information for managerial decision making.

Given then that market information is a key aspect of business organisation the functional parameters of the firm are not only routed through the circuit of production but also through the function of market exchange.^{jr}⁴⁰ It therefore follows that information is part of the firm's economic resource base which needs to be developed and controlled in relation to changes in the economic environment facing firms. Thus, although the commodity, information, is not a physical resource of the firm, as defined by Moss, nevertheless it relates directly to the determination of the business activities undertaken by the firm. For example, how management, through its channels of information, perceives new geographical or product areas of market demand may well shape the type of product the firm produces, the technology and labour input that is utilised, the firm's marketing strategy and the organisational parameters of the firm.

For example, a decision to enter new markets may well induce a number of strategic decisions by management. Firstly, it may require an expansion of productive capacity; an expansion of the firm's stock of physical and human resources. Secondly, a shift in product design; in other words changes in the physical composition of commodities. Thus products have readily definable characteristics which are shaped by market

preferences and by the techniques of production.^ Thirdly, changes in the marketing and production organisation of the firm. As Gassson claims, "To overcome... the obstacles to trade, market making activities are required."^® The firm may well require to increase its output of information to customers through advertising and developing market contacts or by establishing direct sales outlets. By the same reasoning, the firm will also require to increase its inputs of information flows via the development of organisational structures for directing transport and administration functions, monitoring and screening of quality, dispatch etc. Attached to this is the need to extend information flows to adequately monitor production costs, market prices and demand fluctuations. These developments also require an extension of the firm's resource base devoted to such functions: more technically trained managers,^ accountants, office workers, salesmen etc., together with the introduction of office equipment for coordinating business activity.

Thus, the development of effective channels of information are crucial to business success, in the face of constraints facing the firm, and may overcome the entrenched conservatism referred to by Moss. Indeed, in a theoretical exploration of entrepreneurship by Israel Kirzner, entrepreneurs are defined as independent agents each possessing only limited market knowledge, thus Information flows act as a dynamic to market changes which are "set in motion by the initial market-

ignorance of the participants."-^ Thus the market acts as a sounding board for devising strategies in a world of limited and imperfect knowledge. Such arguments clearly undermine two central concepts of the neo-classical theory of the firm; firstly, that the external environment is taken as given and secondly, that there is perfect knowledge.

As to the first assumption, the external environment needs to be reconstructed and the competitive nature of the market defined, which is the task of Chapter 2. In the case of the perfect knowledge assumption then this poses a basic problem for historians; firms operate in an environment of uncertainty and change and a basic condition of capitalist economies is the uncertainty of future outcomes.^ Thus, as Jones argues, the concept of the firm employed in neo-classical theory tends to abstract from most of the characteristics of the real world firm. The neo-classical firm simply converts inputs into outputs within given cost and revenue parameters.^ This static vision of the firm abstracts from the concept of business strategy in different historical epochs and the changing external environment and constraints facing firms.

Returning to Moss's concept of constraints, then there is obviously a need to analyse these factors more fully. Moss identifies three possible constraints to firm development. Firstly, limitations of the firm's resources which prevent expansion when there is "unsatisfied demands for its outputs or which result in underutilisation of resources because other,

complementary, resources are fully utilised." Secondly, limitations of the firm's administrative structure which are in turn related to "inadequate or incomprehensible information flows." Thirdly, market limitations which restrict the firm expanding in relation to its resource base "because the demands for its outputs are growing too slowly or because it is unable to acquire the necessary inputs to sustain the existing or growing activities of the firm."^

These constraining factors are analysed in the context of the Sheffield iron and steel sector, but they also relate to general studies of British economic and business development, particularly in relation to the assumed failings of late nineteenth century entrepreneurs.^ For example, in terms of the organisational limitations of large scale British firms before 1914, Payne has claimed that "management remained only loosely centralised and organisational change was desperately slow even in the vertical combines. Furthermore, Alford argues that higher echelons of management were hampered in their attempt to wrest control over policy making from lower management, before 1945, "by the standard of accounting practices and the undeveloped state of knowledge on marketing.^{CR} Also, economic historians have emphasised the exogenous factor of the slow rate of growth of the market. For example, Temin claims that the slow relative development of the British steel industry in the late nineteenth century was causally related to the fact that it "had access to a market

which was growing less rapidly than those served by its competitors." The consequence of this, was slower growth and investment and the retention of outmoded and less productive plant and equipment.^ However, a smaller market is in itself related to business activity and Supple notes, that "Mass markets simultaneously shape and are shaped by business policies and structures."°°

These factors are discussed in relation to human and resource development throughout this work, especially in Chapters 3-6. However, the above historical illustrations are relevant to the theory of business strategy in the sense that they suggest that British entrepreneurs failed to tackle the internal and external constraints facing them. Such arguments have been directed at the alleged failure of British entrepreneurs particularly in the period 1870 to 1914.-^ Somehow they lacked the indicative qualities emphasised by Casson and failed to generate adequate response mechanisms to changing market circumstances. Summarising Moss's earlier argument, growing competitive pressures will lead firstly to changes in the constraints under which firms operate in the short-run; and secondly increasing competition may well lead to business uncertainty which may well engender excessive caution in formulating an effective strategy. But what response can the firm make to the increasing competitive constraints placed on it?

It is possible to identify three broad sets of changes:

resource development, market expansion and structural change. Resource development, of course, refers to changes in the firm's physical and human resources. For example, changes in the type and quality of labour utilised in the production process will constitute a change in the firm's human resource base. This has obvious connotations for the study of business response in Sheffield firms where the issue of managing the firm's labour input, in terms of a skilled workforce, was a key area of the firm's management strategy. In turn, this will rebound on the firm's physical resource base; in other words, decisions to change the capital-labour mix of the firm through increased mechanisation may overcome the supply constraint of limited skilled workers and thus change the pattern of the firm's human resources. Thus changes in the physical and human resource base are causally interrelated, as shown in Chapter 5.

In terms of the firm's market expansion response, this involves attempts to open up new areas of trade and demand. In particular the expansion of firms into new export markets is one obvious area of business strategy that needs to be fully explored. Thus firms constrained in traditional export markets may seek avenues of demand in the new and expanding areas of international trade. This has obvious links to the exploration of business strategy in the late nineteenth century British economy. Numerous commentators have argued that British businessmen lacked the drive to penetrate new and fast growing areas of world trade and were instead satisfied to rely on the

undeveloped colonial markets for trade expansion.^ These arguments reflect an inadequate market response by businessmen faced with competitive constraints^ and this will be examined in relation to the marketing strategies of Sheffield firms.

However, it must be pointed out that the market expansion response is not divorced from changes in the firm's resources and structural change.^2 The marketing strategy of the firm cannot be separated from the development of the firm's physical and human resources and the structural and organisational changes which accompany market expansion. The type of product produced and the techniques utilised will shape both the institutional market structure adopted and the form of competitive strategy instigated. This can be illustrated by taking the development of standardised production techniques as an example.

Moss refers to the fact that the development of standardised products is a physical property of a commodity "which has been changed or even created by technology." Thus, the definition of standardisation, or cognizability, is for Moss related to the "technological environment" in which firms operate. However, standardisation, either within brands or among the output of several producers provides the possibility of economies of scale reflecting specialisation at both the level of production and exchange. Economies in production will be realised by an increasing division of labour and longer production runs which reduce unit costs. At the level of

exchange, Moss invokes Adam Smith's famous dictum that the division of labour is limited by the extent of the market. Therefore, the physical properties of commodities, shaped by the technological parameters of production and exchange, as the capability of increasing the number of firms or consumers "with which any one firm can trade, and which increases the volume of commodities which the firm has to sell or requires to buy, will increase the opportunities to secure economies of specialisation in exchange.

Exchange economies, in this example, refer to reductions in transaction costs as a consequence of standardised production. Standardisation allows purchasers to buy the output of manufacturers "located at considerable distances from them without incurring the costs of prior inspection ... and ... the costs of agreeing a transaction are very much lower and do not require direct contact between producer and user." ^ Therefore, the development of standardisation (a resource change) is related to structural developments in the firm; in this example the expansion of the firm forward into direct mechanisms of exchange. Indeed, according to one commentator of Britain's marketing performance in the late nineteenth century, "The major innovation in selling overseas after 1870 was the control by manufacturers of the channels of distribution." In their most sophisticated form British firms integrated forward, developing sales branches overseas which gave them greater control over marketing and information flows. ^

The firm thus constitutes a number of distinct functions and if we assume that a firm is geared towards growth then as the firm expands the various functions may well be prone to internal imbalances. For example, investment in new technology which increases the scale of operations may well outpace the existing market mechanism for creating effective demand. Similarly, before undertaking capacity investment, firms must be aware of market conditions, which requires an effective knowledge of markets and competitive trends. These imbalances are constructed into a theoretical analysis by Moss who defines the response process in terms of focussing and inducement effects. Focussing effects are directed towards "imbalances arising from the resources and administrative structure of the individual firm." Thus focussing effects occur because of purely internal factors relevant to the firm's physical and human resources.^{a?} Historically, focussing effects within firms has often led to the development of products and markets which generate general demands for their outputs. Supply factors "dominated the demand factors in order to create extensive markets in which economies of specialisation could be secured in exchange as well as production.

In contrast, inducement effects "turn on technological linkages among the productive activities of different firms and forces arising from competition among firms." These factors then focus the direction of management initiative on new markets and methods of producing commodities for existing

markets "and so pre-empt internal imbalances as objects of managerial attention." Inducement effects are characterised as external to the firm; they "are forced upon the firm as a result of events taking place outside the firm." Nevertheless, the business response will in turn depend upon the internal resources and organisational structure of the firm.^

The concept of focussing and inducement effects clearly relate to the earlier argument concerning the need not only to study internal changes but also to look at the firm in its broader external environment. As Moss points out these effects "are crucial to the analysis of ... those strategies involving either the expansion of existing activities of the firm or related diversification."^ However, if it is technology which determines markets, and competitive pressures are strong, the firm's external response may in itself not be sufficient. The type of physical commodity produced, the cost effective nature of the technology utilised, the speed of dispatch and the ability to meet consumer specifications turn on the ability of management to focus in on specific constraints. Essentially, then, to maintain markets products have to compete and this effectively "means change: the development of new designs, of new standards of performance and so on." Thus, "product change is central to economic growth simply because without it, demand is unlikely to grow."^

The theory of business strategy provides the platform for exploring the constraints and responses of Sheffield firms in

various historical periods. The entrepreneur will be viewed as part of the wider business system of the Sheffield iron and steel industry. In particular, business records of firms will provide a base for exploring Moss's response mechanisms in their historical context.[^] However, before applying this theory to Sheffield, the theoretical analysis remains incomplete. So far, the analysis has been developed in a purely economic form, after all, the firm is a business unit operating in an economic environment. However, to view the firm simply in economic terms is to abstract from the political factors which may enhance or constrain business performance and thus in itself may demand a political response on the part of businessmen. As John Turner argues, "the special contribution of businessmen, who were after all intimately concerned with industry's problems has never had the attention in Britain which has been accorded to it in other industrial countries."^{*7^}

Therefore, we need to consider not only the economic constraints and responses but also the political factors relevant to business development. In other words, we need to incorporate a political economy approach to business history within the framework of the Moss analysis. For example, Elbaum and Lazonick emphasise the political-institutional constraints facing British businessmen, notably the retention of free trade in an environment of growing competition, which "obstructed individualistic as well as collective efforts at economic renovation."^{^4} As Pollard claims, the significance of the

political system, 1870-1914, "and the consequential negative role of government in this period, has been overlooked far too long in the literature. The political response of Sheffield's business community to issues such as protection, government intervention, and rationalisation are taken up in Chapters 7 and 9 where the relationship between local and national political economy is considered. However, we now turn to a reconstruction of the Sheffield steel industry before 1914, moving from the theoretical world of business strategy to the historical world in which real firms operated.

Notes and References

1. 8.W.E. Alford, "Entrepreneurship, Business Performance and Industrial Development", *Bus. Hist.*, vol.19, no.2, (1977), p.116
2. See for example the excellent studies by S. Pollard, *A History of Labour in Sheffield* (1959); G. Tweedale, *Sheffield Steel and America: A Century of Technological Interdependence 1830-1930* (1987).
3. D.F. Channon, *The Strategy and Structure of British Industry* (1973), p.v. See also L. Hannah, *The Rise of the Corporate Economy*, (London 1983), p.8.
4. P. Mathias, "Business History and Management Education", *Bus. Hist.*, vol.15, no.2, (1975), p.4
5. It is not the intention here to engage the rather confusing and circular arguments concerned with defining what business history actually is. See for example A.H.Cole, "What is Business History?", in K.A. Tucker (ed.), *Business History: Selected Readings* (1977).
 - b. There is now general agreement that systematic historical studies of business behaviour, structures, and policies, and of their consequences for the economy as a whole ... are ... of considerable relevance to a broader understanding of economic processes." B. Supple, "Introduction: Approaches to Business History", in B. Supple (ed.), *Essays in British Business History* (1978), p.1.
7. See D.C. Coleman, "The Uses and Abuses of Business History", *Bus. Hist.*, vol.24, no.2, (1987), pp.141-56; and L. Hannah, *Corporate Economy*, p.6.
8. Coleman, "Uses and Abuses", p.151.

9. For a broader discussion of these arguments see R. Lloyd-Jones & M.J. Lewis, *Manchester and the Age of the Factory* (1988), pp.194-6.
10. S. Moss, *An Economic Theory of Business Strategy* (1981).
11. A.D. Chandler, *Strategy and Structure*, Chapters in the History of the American Business Enterprise (1962); *The Visible Hand: The Managerial Revolution in American Business* (1977); E. Penrose, *The Theory of the Growth of the Firm* (1959); P.W.S. Andrews, *Manufacturing Business* (1949).
12. Coleman, "Uses and Abuses", pp.151-2.
13. Moss, *Business Strategy*, p.14
14. *Ibid.*, p.16.
15. *Ibid.*, p.17.
16. *Ibid.*, pp.17-18.
17. *Ibid.*, p. 18.
18. *Ibid.*, p. 19.
19. *Ibid.*, p. 21. See Hannah, *Corporate Economy*, p.153, on managerial diseconomies of scale.
20. B.J. Loasby, "The Entrepreneur in Economic Theory", *Scottish Jnl. of Political Economy*, vol.29, no.3 (1982), p.244.
21. M. Casson, *The Entrepreneur: An Economic Theory* (1981), pp.22-3.
22. Chandler, *Strategy and Structure*, p.11.
23. Casson, *The Entrepreneur*, p.23.
24. This fits Moss's definition of the organisational structure of the firm.
25. Casson, *The Entrepreneur*, pp.23-4.
26. L. Hannah, "Managerial Innovation and the Rise of the Large-Scale Company in Interwar Britain", *Econ. Hist. Rev.*, vol.27, no.2 (1974), p.258, also notes that firms could not rely solely on external managerial expertise but "increasingly developed by the training of functionalist specialists and departmental managers within the manufacturing enterprises themselves."
27. Casson, *The Entrepreneur*, p.29.
28. *Ibid.*, p.35. We could also mention here the ability to absorb risk; as Payne claims, a legitimate task of entrepreneurs is to reduce risk to a minimum. See P.L. Payne, "Industrial Entrepreneurship and Management in Great Britain", in *The Cambridge Economic History of Europe*, vol.7 (1978), p.184.
29. Alford, "Entrepreneurship", p.117.
30. Moss, *Business Strategy*, p.28.
31. For a discussion of these various theories see *Ibid.*, pp.28-31; M.C. Sawyer, *Theories of the Firm* (1979); R. Marris, "Why Economics Needs a Theory of the Firm", *Econ. Jnl.*, vol.82, (1972); R. Jones, *Supply in a Market Economy* (1976).
32. Moss, *Business Strategy*, pp.28-9.
33. C.K. Hyde, *Technological Change and the British Iron Industry 1700-1870* (1973), p.163.
34. The neo-Schumpeterian approach is associated with the work of Nelson and Winter and "focuses on the evolutionary growth path generated by the aggregated actions of individual firms searching for new and profitable production techniques." See, for example, R. Nelson & S. Winter, "Towards an Evolutionary Theory of Economic Capabilities", *American Economic Association Papers and Proceedings*, vol.63 (1973).

35. R.S. Hartman & D.R. Wheeler, "Schumpeterian Waves of Innovation and Infrastructure Development in Great Britain and the United States: The Kondratieff Cycle Revisited", *Research in Economic History*, vol.4 (1979), p.43.
36. Referred to by Hartman and Wheeler as "a change in regimes", *Ibid.*, p.43.
37. *Ibid.*, pp.43-4.
38. Hannah, *Managerial Revolution*", p.254;
39. Chandler emphasises the development of managerial hierarchies who once they had successfully carried out their function of administrative coordination became themselves a source of permanence, power and continued growth. Chandler, *Invisible Hand*, p.12. This would seem to contrast markedly with the British experience.
40. Chandler, *Strategy and Structure*, p.41.
41. See Loasby, *The Entrepreneur in Economic Theory*", p.235.
- 42 Moss, *Business Strategy*, p.38.
43. *Ibid.*, p.32. Such a proposition, fits the alleged failings of late nineteenth century entrepreneurs.
44. Casson, *The Entrepreneur*, p.168.
45. *Ibid.*, p.166.
46. P.J. Riden, "The Iron Industry", in R.A. Church, *The Dynamics of Victorian Business* (1986), p.78, claims that historians of the industry have "devoted more attention to technology and production than sales and distribution."
47. The product of the firm has recognizable, physically specified characteristics, and is a physical resource of the firm. For example, it will be argued, in Chapters 4 and 5, that the type of labour input to the production of commodities determines the physical composition of the good in the market.
48. Casson, *The Entrepreneur*, p.165.
49. See S. Pollard, *The Genesis of Modern Management*, pp.157-8; also M.J. Lewis, "G.T. Clarke and the Dowlais Iron Company: An Entrepreneurial Study", Unpublished MSc. (University of Wales, 1983), Ch.2.
- 50 I. Kirzner, *Competition and Entrepreneurship* (1973). See Loasby, "The Entrepreneur in Economic Theory", p.243.
51. See Joan Robinson, *The Accumulation of Capital* (1956), p.181 who remarks that "Tomorrow lies in the future and cannot be known."
52. R. Jones, *Market Economy*, p.22.
53. Moss, *Business Strategy*, pp.38-9.
54. See, D.S. Landes, *The Unbound Prometheus* (1969), esp. Ch.4. The lack of a dynamic response by British entrepreneurs has reappeared in interpretations of Britain's post-1945 decline. See, for example, R.E. Rowthorn & J.R Wells, *De-industrialisation and Foreign Trade*, (1985); K. Smith, *Britain's Economic Crisis* (1984)
55. P.L. Payne, "The Emergence of the Large-Scale Company in Great Britain", *Econ. Hist. Rev.*, vol.20, no.3 (1967) p.534.
56. Alford, "Entrepreneurship", p.128.
57. P. Temin, "The Relative Decline of the British Steel Industry, 1880-1913", in H. Rosovsky (ed.), *Industrialisation in Two Systems: Essays in Honour of Alexandra Gerschenkron* (1966), p.142.
58. B. Supple, "A Framework for British Business History", in Supple

(ed.), Essays, p.18.

59. For a broader analysis of these arguments see P.L. Payne, British Entrepreneurship in the Nineteenth Century (1974), pp.45-56; "Industrial Entrepreneurship", pp.201-11

60. See, E. Hobsbaum, Industry and Empire (1969), p.191; M. Kirby, The Decline of British Economic Power Since 1870 (1981), p.8;

61. This is taken up in relation to Sheffield firms in Chapter 5.

62. As Moss, Business Strategy, p.39, claims, "resource and market limitations cannot usefully be analysed separately.

63. Ibid., pp.123, 125-7.

64. Ibid., p.129.

65. S.J Nicholas, "The Overseas Marketing Performance of British Industry 1870-1914", Econ Hist Rev, vol.37, no.4 (1984), p.505.

66. As G. Stigler, The Organisation of Industry (1968), p.131, claims, the firm is engaged in a number of distinct operations: purchase, storage, production, marketing, selling and distribution.

67. Moss, Business Strategy, P.62.

68. Ibid., p.128.

69. Ibid., pp.62-3.

70. Ibid., p.64.

71. Smith, Economic Crisis, p.41. Thus product and process innovation are crucial to our understanding of business and market development. See N. Rosenberg, Inside the Black Box: Technology and Economics (1982), pp.4, 237.

72. This takes up Payne's call for a "proper assessment" of entrepreneurial performance by reference to business records. Payne, British Entrepreneurship, p.51.

73. J. Turner, "The Politics of Business", in J. Turner (ed.) Businessmen and Politics: Studies of Business Activity in British Politics 1900-1945 (1984), P.i:

74. B Elbaum and W. Lazonick (eds.), The Decline of the British Economy (1986), p.2

75. S. Pollard, Britain's Prime and Britain's Decline: The British Economy 1370-1914 (1989), p.259.

The Business Structure of Sheffield's Iron and Steel Industry, 1880-1901.

By 1880, few observers would deny Sheffield its premier role as the major iron and steel producing centre in Britain. Sheffield's industrial structure revolved around a myriad of distinct though interlocking trades, ranging from basic steel production to heavy engineering and armaments, and the light industries of cutlery and tool fabrication. Thus industrial structure constituted a mixture of both light and heavy industry producing iron and steel products for both the consumer and capital goods markets:

On the heavy side of the industry, Sheffield was the home of the great works ... On the lighter side, Sheffield crucible steel ... remained the worlds finest material for knives, tools, and machine parts ... perhaps best known of all were the cutlery and silver plating firms.

Thus Sheffield's economic structure was directly associated with the development and prosperity of its various metal industries. However, the business structure of this key industrial sector has received little systematic analysis, with the exception of the work by Timmins on the Sheffield crucible steel industry, and a preliminary investigation of industrial structure by Lloyd-Jones and Lewis." The aim of this chapter is to build on this latter work, analysing the business functions of a population of firms, the size structure over time and the rentier characteristics of the industry.^ Furthermore, an analysis will be made of the role of small firms and the

retention of a business organisation which retained the principles of family control. This chapter outlines a system of small competing firms which forms the basis for later chapters on business strategy.

By 1880, Sheffield could boast some of the largest steel and heavy engineering firms in the world, household names such as Vickers, Charles Cammell's, Firth's, and John Browns.^ These firms expanded rapidly in the second half of the nineteenth century, the number of workers employed by Browns, for example, increasing from 200 in 1856 to 5,000 by 1872.^ By 1907, four heavy steel producers, based in Sheffield, were listed amongst the largest 104 manufacturing employers in the UK.° In the light trades, large cutlery producers such as George Wostenholms, and Joseph Rodgers & Co. had established themselves as prominent exporters to all corners of the world.†

According to D. Smith, by the end of the nineteenth century, "the huge factories and monotonous workplace routines of large-scale industrial capitalism were a gigantic social fact", and dominated the structure of the industry.^ However, before accepting such a proposition we might do well to heed Hannah's observation that the pattern of development in such industries as cotton, iron and chemicals "favoured the multiplication of small firms rather than the dominance of large ones."^ As Dobb points out, the existence of small-scale business "has been a pronounced feature of each stage of economic history"; every economic system is a mixed system, comprising large, medium and

small firms and "any full understanding of economic movement and development¹ is largely influenced by the interaction of these conflicting elements.¹⁰ This view is reinforced by Timmins, who observes that even by 1900, "the day of the small-scale steel firm was by no means at an end."-^

Thus in order to examine the structure and pattern of change in Sheffield's iron and steel sector, what is required is a reconstruction of firm populations over time. How dominant was the large-scale firm, was there any discernible tendency towards increased concentration, and what was the pattern of development in terms of survival, exit and entry rates? The primary data source for this reconstruction is the Sheffield rate books-¹¹ which provide a mine of information on the numbers and size of iron and steel firms in the city. The books give a detailed description of property, the location of the property, the owners and or occupiers, the rateable value (RV), and whether the property is fully or partly utilised. RV's are thus utilised as a proxy for the fixed capital assets of the firm.-^ Furthermore, by detailed cross-referencing with the local trade and commercial directories, it is possible to provide a breakdown of the numerous trades which made up the complex system of business organisation in the metal industries.

Table 2:1: A Profile of Sheffield firms, 1880.

No of firms	Total RV	Average size per firm
	(£)	(£)
319	133,700	419

Source: Sheffield Rate Books, 1880.

As a starting point, the structure of the industry in 1880 was reconstructed. A total of 319 firms was identified[^] and the number, the total and average RV is given in Table 2:1. An average RV of £419 would locate the typical firm as a medium size enterprise, within the range RV £151-£500.-[^] However, average figures may well disguise the wide range in size patterns and the concentration of small firms in various industrial sectors. Thus, we require a classification of industry type and of size categories. Turning first to the issue of industrial classification, then this obviously creates problems. Payne, for example, in an extensive study of early Scottish limited companies, utilises the American Standard Industrial Classification but notes that exact precision, on the basis of company information on business activity, is virtually impossible to achieve.[^] The problem here refers to the diversity and overlapping of business activity in Sheffield's trades. For example, it would be easy to define a steel firm as such, as a basic commodity producer. However, in many instances steel firms combined basic production with fabrication. To illustrate this point, the firm of Brown, Bailey & Dixon Ltd., operating an extensive plant rated at £6,893 in 1880, produced various heavy Bessemer steel products for railway and shipbuilding demand, but also produced light steel files and saws. Similarly, the smaller firm of Thomas Colver & Co. (RV £125) produced basic steel and fabricated saws, files and machine knives. In cutlery, a firm such as

Christopher Johnson & Co. (RV £274) combined cutlery production with steel and tool production.^

Given this structural characteristic, there is an obvious need to simplify the industrial classification and provide a working definition of the term industry in relation to the Sheffield trades. Sargent Florence defines an industry as any kind of transactions, products or processes, usually specialised in by a number of plants which do not necessarily perform much of any other kind of transaction. Furthermore, he distinguishes between basic producers and fabricators, the former "refining or producing the raw material and the latter "converting and assembling it into the final product."-^ It thus follows that there are three rules for industrial classification: differences in type of product produced; differences in selling markets; differences in technical processes. These rules for classification have been analysed by Nightingale who defines an industry as "any grouping of firms which operate similar processes within a given planning horizon. This definition of industry thus mirrors Moss's definition of the firm, which is defined in terms of the physical and human resources which constitute the business enterprise.

Using this definition, and by a systematic analysis of the trade directories and description of plant in the rate books, it was decided to group firms under the four major industrial categories shown in Table 2:2. (See Appendix A, Table 1). The

divisions between the industries are based on the following criteria. Firstly, basic producers (B) are defined on the grounds that they produce the basic raw material for finishing elsewhere. Secondly, G and TE are distinguished by the fact that one is a consumer good and the other a capital good.²⁰ Hence they produce different goods and sell to different markets. GT is a catch-all category which includes firms producing both capital and consumer goods. However, a distinction based on technical processes is more problematic, due to the fact that similar techniques were used in all four categories.²¹ For example, as indicated throughout this work, the use of skilled labour as a human resource of the firm was a key characteristic of Sheffield firms, although firms in the heavy steel sector tended to employ more unskilled resources.²² For example, Thomas Vickers referred to the small-scale and high labour input of producing steel ingots in the crucible, in comparison to the less labour intensive operations of the small number of firms producing by the Siemens process. J

Table 2:2: Industrial Classification of 319 Sheffield firms in 1880

Industrial type	No	%	Total RV (£)	Av. RV (£)
3	60	18.8	21,107	351.3
G	97	30.4	14,832	152.9
TE	148	46.4	94,923	641.4
cr	14	4.4	2,838	202.7
Total	319	100.0	133,700	419.1

Source: Rate Books, 1880; Directory 1880.

Table 2:2 indicates that the largest sector was TE which represented 46% of all firms and accounted for 71% of the total RV. Furthermore, 90 TE firms were integrated, confirming

Timmins claim that there was a general tendency towards vertical integration, "both backwards into the production of raw materials and forwards into the finishing stages."²⁴ This suggests an integrated system where there was room for a complexity of business functions ranging from integrated steel producers to firms who relied on outside supplies of the basic raw material. The small-scale nature of the cutlery sector is also evident in Table 2:2, but can we be more precise in our size categories?

Turning to this question, RV's are utilised as a proxy of size, following the procedures adopted by Lloyd-Jones and Lewis in their study of the Manchester economy.²⁵ indeed, Timmins in his analysis of crucible steel refers to large-scale firms with a RV of £800 plus and medium firms which appear to fall between £150-£500.²⁶ Unfortunately correlating data for employment, or valuations, for Sheffield is not available; nevertheless, it is possible to determine cut off points, defining size categories from raw RV data, by plotting clusters of firms and determining the break off points. These are shown in Appendix A, Table 2, and produce the size categories displayed in Table 2:3.

Table 2:3: Firm Size Categories by RV, 1880-1901.

Size category (RV)	Description
(£)	
1-150	Small
151-500	Medium
501-1,500	LargeJ
1,500-+	Giant^

Notes: a. Large firms are designated RV £501-1,500 which was arrived at by following the procedure adopted by P. Sargent Florence, Post War Investment, Location and Size of Plant (1962), p.60,

who defined size categories by a multiplication process, the multiplier being 3.

b. A further category "Giant" was introduced to capture the large producers at RV £1,500 plus.

Utilising the RV data as size categories, the 1880 industrial structure is reconstructed and presented in Table 2:4. The data shows that small firms formed a significant proportion of the industrial structure, especially in G where 72% of all firms were small. This suggests an industry dominated by small private competing firms which would in turn affect the strategies adopted by firms. According to Utton, "the number and size distribution of firms in individual industries are evidently closely bound up with their behaviour and performance." Thus, the more concentrated an industry, the less likely is it to conform to the assumptions predicted for perfectly competitive industries.⁷ Here the emphasis is on market concentration, and RV data provides a proxy for concentration, given the caveat that the tentative nature of this estimate is kept at the forefront of the analysis.

Table 2:4: Size of 319 Sheffield firms by Industry Type in 1880.

Industrial Type	Size Categories									
	Small		Medium		Large		Giant		Total	
	No	%	No	%	No	%	No	%	No	%
B	28	46.7	21	35.0	8	13.3	3	5.0	60	100.0
G	70	72.2	21	21.6	5	5.2	1	1.0	97	100.0
TE	77	52.0	43	29.1	16	10.8	12	8.1	148	100.0
CT	7	50.0	7	50.0	0	-	0	-	14	100.0

Source: Rate Books, 1880.

In terms of concentration, the usual practice is to make a distinction between concentrated, medium concentrated and unconcentrated industries, based on the three or four largest

firms in the industry.^ Table 2:5 shows the estimates offered by the most detailed UK and US studies, and Table 2:6 provides an estimate of concentration, for each industry type, based on the proportion of the RV of the three and four largest firms to total RV. Industry G is clearly unconcentrated under both schemes of measurement, while industry B is on the borderline of unconcentrated and moderately concentrated. However TE is moderately concentrated under both schemes. Industry GT is highly concentrated on both counts, but this is distorted because they performed in both industries TE and G, and as one would suspect, dual process firms tended to be larger.

Table 2:5: A Guideline to Industrial Concentration Ratios.

Industry Type	Estimates of	Estimates of
	Everly & Little (3 largest firms) ³	Kayser & Turner (4 largest firms) [^]
	%	%
Concentrated	67	50+
Moderately concentrated	33-66	25-49
Unconcentrated	-33	-25

Notes: a. Everly and Little utilise the contribution of the largest three firms to total output and employment.
b. Kayser and Turner utilise the contribution of the four largest firms to total output.

Source: R. Everly and I.M.D. Little, *Concentration in British Industry* (1960), p.51; G. Kayser and D.F. Turner, *Antitrust Policy: An Economic and Legal Interpretation* (1959), pp. 295-7. See also R. Lloyd-Jones and M.J. Lewis, *Manchester and the Age of the Factory* (1988), p. 164, who also utilise these categories.

Table 2:6: Concentration of the Three and Four Largest firms in Sheffield, 1880a

Industry Type	% of 3 largest firms	% of 4 largest firms
	to total RV	to total RV
B	35.2	29.8
G	28.8	24.5
TE	44.9	38.4
GT	51.9	41.3

Note: See Appendix A, Table 3 for a list of these firms.

Source: Rate Books, 1880.

This clearly represents an highly competitive structure, although the dominance of large firms such as John Browns and Vickers in industry TE, companies which expanded rapidly on the basis of armaments production, would suggest a larger degree of power by these firms in this sector. Nevertheless, an industry based on small-scale firms would have the following characteristics. Firstly, as Sargent Florence claims, "the smaller the scale of operation and the fewer the total number of persons dividing and diffusing their labour, the less chance there is for all of them being made use of as *s p e c i a l i s t s*." ^ Thus we would expect a highly diverse division of labour, and as shown in Chapter 4, an intense sub-division of labour was a major feature of the light Sheffield trades, which shaped the human resource response of the firm in terms of the introduction of mechanisation and in wage negotiations. Furthermore, we would expect little collusion of business activities, in terms of wage and price fixing, in an industry composed of large numbers of small-scale units. This view is supported in Chapter 4, although the competitive pressures of large Sheffield producers in the area of marketing, especially in the sale of high quality tools, is emphasised in Chapters 5 and 6.

Secondly, we would expect an high failure rate of small firms given the growing competitive pressures and periods of severe depression which affected the industry prior to 1914.^ G.I.H. Lloyd, in an excellent account of the cutlery industry,

written in 1913, refers to the historical incidence of small-scale firms in this industry "and under such conditions it is unusual to find any great degree of permanence in the case of an individual firm." However, he noted that amongst the largest cutlery firms in 1913 there were several who could trace their origins, from small family beginnings, over a continuous period of one and two centuries.¹ Amongst these were the large firms of Joseph Rodgers, James Dixon & Sons, and George Wostenholmes.² Similarly, firms producing steel and tools could trace their history back a number of generations. For example Marsh Bros, could trace its history to 1761, and Daniel Doncaster's to 1829 and a number of large firms such as Brown's and Cammell's had started from small beginnings.³

Appendix A, Table 5 provides a biographical profile of the 319 firms constituting the 1880 population. Of these firms, 212 or 66.5% of the 1880 population survived to 1901. However, what is remarkable is the high percentage of small firms which survive; 59% of all small firms in 1880 surviving to 1901. Even in cutlery, an industry dominated by small-scale producers, 62% of all small firms survived. This holds out the possibility that small firms provided a resource pool for future growth and development in the industry.⁴ According to Steindle, there is a negative correlation between mortality rates and the size of the firm; in many cases the small firm fails and never grows to maturity due to the high degree of business risk.³⁵ This proposition is not supported by the Sheffield evidence and as

Penrose points out, Steindle's analysis is a static or cross-section approach which does not allow for dynamic growth. As she states,

It would seem that at any given time a fair number of small firms would be in existence simply because they were young, and that at a later date the same firms would have developed into medium-sized or large firms. D

This mirrors Alfred Marshall's trees of the forest analogy, whereby small firms are assumed to follow a path of continuous growth, supplanting new large firms to replace those that stagnate or decay.[^] It is worth recounting that Marshall referred to only a small number of "young trees growing up to maturity" and warned that "many succumb on the way."[^] Certainly the growth performance of small firms in industries C and TE appear to confirm Marshall, as shown in Table 2:7. Taking all small firms together a total mobility rate of 17% or one in four is evident from the data. Furthermore, as Lloyd-Jones and Lewis show, it was upward mobility and not entry which sustained the large size category. Overall, industrial structure remained stable with no significant trend towards specific size categories.¹¹⁹

Table 2:7: Rates of Upward Mobility of Small Sheffield firms 1380-1901

Industry Type	% of small firms
3	14.3
C	15.7
TE	20.8
CT	14.3

Table 2:8 compares industrial structure in 1880 to 1901. What is significant is the retention of large numbers of small producers. The reasons behind this are of course difficult to

assess, given the lack of business records on the smaller business unit. However, we can make a number of reasoned points which are supported in following chapters. Firstly, small-scale production allowed flexibility in producing high quality products to meet demands for order. Thus smaller firms could more easily switch production processes to meet changes in demand. As W. Lockwood Marsh, the managing director of Marsh Bros.^ remarked in 1954,

The outstanding impression one gets is of the extraordinary resilience and adaptability of a small private firm ... when demands for one particular product ... disappeared, those in charge for the moment always seemed capable of striking out a new line.^1

Table 2:8: Shifts in Industrial Startups by Industry Type 1880-1901

Size Category	Industry Type															
	B				C				IE				cr			
	1880	1901	1880	1901	1880	1901	1880	1901	1880	1901	1880	1901	1880	1901	1880	1901
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Small	28	46.7	31	48.4	70	72.2	69	66.4	77	52.0	80	47.3	7	50.0	13	50.0
Medium	21	35.0	21	32.8	21	21.6	25	24.0	43	29.1	56	33.1	7	50.0	11	42.3
Large	8	13.3	9	14.1	5	5.2	10	9.6	16	10.8	17	10.1	0	0.0	2	7.7
Giant	3	5.0	3	4.7	1	1.0	0	0.0	12	8.1	16	9.5	0	0.0	0	0.0
Total	60	100.0	64	100.0	97	100.0	104	100.0	148	100.0	169	100.0	14	100.0	26	100.0

Source: Rate Books 1880., 1901.

An example of diversification is illustrated by the growth of combined CT firms by 1901 (Table 2:8); firms could thus shift production processes to meet changing market requirements. Indeed, as the London agent of the Large steel and tool firm of Joseph Beardshaw & Co. noted in 1903, the flexibility of the small firm could be a considerable asset. For example, the firm found difficulty in procuring orders from London wholesale houses because they dealt with small firms who could produce

equal quality, remedy mistakes and "are more willing to work to ... instructions ... he knows their customers requirements better than they do." ^

Secondly, the use of outwork as the mainstay of the light trades fostered a business system that was conducive to small-scale production. Outwork was particularly common in smaller firms who could rely on sub-contracting to reduce the fixed capital costs of operation. However, larger manufacturers combined inwork with outwork due to the more "intricate nature of the plant and equipment. As will be argued later, this partly accounts for the slow adoption of mechanisation and mass production techniques in the cutlery and tool trades, and the use of outwork was a key element in an industry producing low volume, high quality produce. Thirdly, as Pollard argues, the capital costs of setting up business were in all probability low, and credit formed the basis of the smaller firm. ^ Indeed, the high entry rate of small firms between 1880 and 1901 ^ would support the view that in an industry with a heavy labour intensity the capital costs of starting business were low. ^

Furthermore, in all probability firms were directly routed into the circuit of exchange via a specific merchanting function. Most firms producing steel and cutlery and tool products were also listed in the directory as merchants, and most were recorded in the rate books as operating warehouses. 4 ^ This would suggest that small firms were as much merchants as manufacturers which reinforces the notion that credit was a key

element in the chain of production. The merchanting function of the Sheffield trades requires more extensive examination. However, evidence to the 1893 Select Committee on the Sweating System noted the existence of numerous "factors or merchants" in the cutlery trades who operated from a central warehouse, they did "not employ workmen direct, but they obtain orders and give them out to the little master, who is himself a workman. That firms could expand their exchange and manufacturing functions is emphasised by the firm of T.A Ashton, who in 1880 operated a small cutlery workshop and warehouse in Norfolk Street, Sheffield, RV £48, and were described as cutlery manufacturers and merchants. By 1901, the firm had expanded to RV £198, largely by adding warehouses and retail shops to its workshops.

Finally, the rentier base of Sheffield's business system needs to be considered. The renting of space and power by larger manufacturers, in the light trades, to workers and small masters is well known.^{SO} However, firms themselves were directly linked into a rentier system which encompassed the majority of Sheffield's trades. Appendix A, Table 6, provides a breakdown of the 1880 population of firms by renting or owner-occupancy.^{S1} All industries display a high degree of renting with 41.1% of the 1880 population of firms renting property. However, it is clear from the data that the typical medium and large firm was an owner-occupier and as one would expect no firms in the Giant category rented property. However, the

small-scale category showed a marked tendency towards renting, accounting for 56.6% of all small firms.

Thus, a characteristic of small firms was the very fact they were rentiers which provided an easy route to circumvent the capital costs of entering the industry and held out opportunities for small capitalists. Furthermore, the lower fixed costs attached to renting may well have provided the firm with a buffer against the risks attached to business. Indeed, the numerous advertisements in the Sheffield newspapers for rented business premises are suggestive that there was an ample supply of space for small business as the following examples illustrate:

To let. Large shop ... with engine power, smith's hearth with blast, hardening furnace and office, suitable for a saw hardener or machinist.

To let. Shoreham Electro-Plate Works ... recently built at great cost ... fitted with plant and machinery of the most modern construction. ^

To let. 10 hole melting furnace, with steel warehouse and offices, in centre of town. ^

The emphasis which has been placed on the small firm should not however detract from the considerable expansion of the heavy sector of the industry, especially firms in armaments which found a growing domestic demand for its output after 1880.^° Appendix A, Table 7, shows the expansion of the RV of the giant firms of 1880, and those large firms which were mobile upwards between 1880 and 1901. Of the 20 firms in this sample, 14 firms show an increase in RV, and overall there was a 64.7% increase in the total RV of these firms between 1880 and 1901. In particular, the firms of Charles Cammell's and

Vickers expanded rapidly as they moved into the production of bulk steel for ship-plate and armaments; the RV of the former increasing by 120% and the latter by 354%; by 1901, Vickers was the largest firm in the City. That a large firm such as Vickers could exert a considerable influence in relations with Government contractors was emphasised by the agent of Beardshaw's in 1900 who complained that government contracts were excluded from the firm by the "favour" given to the representatives of Vickers and by price undercutting.-^

The structural features of Sheffield's iron and steel sector in this period would however suggest the retention of a thick undergrowth of small-scale and medium firms which together accounted for 85.9% and 84.3% of the total population of firms in 1880 and 1901 respectively. This would suggest certain properties in relation to the organisational structure of the firm. For example, the Bolton Committee on Small firms in 1971 defined an essential characteristic of small firms as management by owners or part owners, and the firm was managed and owned by the same people. They further noted the heavy influence of family control within the smaller business unit.^ however, even with large public formations, as in the conversion of a number of Sheffield steel firms to public liability status in the 1860's and 1870's, the retention of family control was all too obvious. For example, J.W. Dixon, an electro-plate manufacturer, informed the 1886 Select Committee that the effect of limited liabilities in Sheffield had not

"disarranged" trade as "the management remains the same, the capital is only owned by a large body of men instead of by one or two."-^

As Lloyd-Jones claims, the example of Sheffield tends to fit in with comparative studies of business in the USA and Germany which characterises British business structure in terms of the slow pace of mergers, the failure of family firms to assume public limited status, "and the consequent resilience of family control in the affairs of the firm."^ Certainly the evidence from the rate books for 1880, which listed those who paid the rate, would indicate a high degree of family involvement in the management of the firm.^ This is supported by the available business evidence from company records. The records surveyed and their business activities are shown in Appendix A, Table 8, which clearly indicates that apart from the firm of Burgon & Ball, which converted to a public limited in 1898,^ the firms retained their individual status through the adoption of private limited status.¹⁰³ Thus firms could adopt limited liability without altering the existing managerial structure of the business. As the management of Spear & Jackson remarked in 1905, "this company was converted into a private limited company, the partnership practically remaining as before.

One feature of this was the use of retained profits and family capital in the process of business expansion. The existing owners of the firm financed expansion by issuing new

share capital to the existing members. For example, the share capital of the firm of Spear & Jackson was largely held by J.K. Wilson, the managing director and executor of the will of J.F. Jackson, a founding partner in the concern. In 1907, the share capital of the firm was increased by the creation of 10,000 new ordinary shares of £1 each, raising capital from £75,000 to £85,000. Furthermore, mortgage debentures were issued to directors as a form of capital investment, this liability increasing from £20,000 in 1906 to £30,000 by 1909. Indeed, for a firm clearly orientated to the retention of the existing managerial structure, the Companies Act of 1907, provided an opportunity to restrict outside capital, limiting share holders to 50 and prohibiting the subscription of the public for share or debenture stock.^ The importance of family capital was clearly evident in the case of Edgar Allen & Co. As the major shareholder, William Edgar Allen, remarked in 1907,

my Co-Directors ... considered my first duty was to invest my money in Edgar Allen & Co. Ltd. preference shares because they wanted more working capital for plant etc., and I have locked up thousands of pound^s the firm was owing me by leaving it to Edgar Allen & Co.

Similar procedures were adopted by the other firms for which adequate records survive. For example, Beardshaw's in 1908 reported that a considerable sum had been spent on developing new markets, financed from revenue, and altered their articles of association in 1908 to encompass the restriction of private liability in the 1907 Act and prohibiting share subscriptions from the public. The use of

debenture shares was further evident with the company mortgaging its plant to the total of £25,000 on its incorporation in 1893, and borrowing at 5% interest on the capital.[^] Indeed the firm of Cooper Bros & Co. had from its incorporation excluded the use of outside capital, including in its articles of association in 1895 the power to raise capital by issuing debenture stock, preference, or guaranteed shares. However, no shares were to be transferred by any member of the company other than the family directors, T. & J.W. Cooper.^{c 8} This evidence supports the general proposition of Thomas, that prior to 1914 the demand for external funds was small, and even in boom periods not more than 10% of real home investment was financed by market borrowing.^{a q 7}

The evidence for company mergers would also tend to support the view that they were usually loose combinations and could be restricted by the influence of the family to retain some degree of control. For example, the take over of the Effingham Steel & Rolling Mills Co., facing financial troubles, by Marsh Bros, in 1896, was complicated by the insistence of the majority shareholder, R.B. Maltby that he should retain a seat on the board. Although this was resisted, the company was controlled as a loose subsidiary, the majority shareholders being the Marsh family, who provided injections of share capital at various stages. The firm was to "be continued in the same name ... in reality there is only a change in the directorate."[^] Similarly, the take over of Drabble &

Sanderson, saw manufacturers, by Spear & Jackson in 1908, saw the retention of the existing managerial structure, the firm being run as a loose subsidiary, Spear & Jackson controlling the marketing end of operations.⁷¹_x

The recruitment of family members within the managerial structure of the firm is further emphasised in these case studies. For example, even in a firm such as Spear & Jackson, which was managed by a board of director executors, the role for family members was important. Thus, in 1911, D. Jackson Haggie, the grandson of J.B. Jackson, was appointed as manager of the sales department, having been trained in the various departments of the works.⁷²* Similar examples of family recruitment, especially in the marketing end of the business, are evident in the example of Wostenholmels, Beardshaw's, and Burgon & Ball. Indeed, the resistance of the family to the recruitment of professional managers to directorships may well have reduced the quality of entrepreneurship. For example, R. Woodward, the resident Managing Director of Edgar Allen's, informed William Edgar that our "business is now a big one and requires watching more than ever", thus they should appoint departmental managers to directorships as a means of transferring responsibility and experience to "junior" directors. However, this was firmly resisted by William who claimed that they had no responsibility to departmental managers who had been trained at the firm's expense, and the transfer of shares to new directors would close the

opportunities for directors to be replaced by family members. The matter was resolved by appointing four "special¹¹ departmental directors, attaining no share holdings and acting in a purely advisory capacity.^{^3}

In the case of this firm, a continued reliance on internal share capital acted as a constraint on development. The 1907 Companies Act restricted shareholders in private companies to 50,[^] forcing the company to consider the possibility of selling shares publicly, as they had 29 ordinary and 135 preference holders. This factor, together with the need for a large investment of £10,000 for expansion, prompted William to argue that this could not be provided from "personal and private funds" and the use of retained profits would severely reduce profits. Thus the company should sell shares to the public but also ensure that the existing directors retained control by holding the bulk of the original shares.'^{7*} However, reorganisation was obstructed as they could not establish a price for the company's shares on the open market. As William argued, they could not seek a quotation in London because

"Our shares have no market even in Sheffield. An odd sale now and then does not make a market price, which is very much against planning our preferences ... the Stock Exchange is ... a business concern got together for their own mutual and individual profit . not to oblige you and me how to help us to buy and sell. °

The basic constraint to the firm's ambitions thus revolved around the problems of selling shares on the open market without losing control over operations. This was further complicated by the rules of the Stock Exchange which stipulated

that 2/3 of new shares should be offered to the public.^ Thus an alternative strategy of issuing new ordinary shares to raise capital would not conform to market requirements where shares were freely transferable, when the articles of the company prohibited transfers without the consent of the directors.⁷⁸ The solution here was to remove the prohibition on transfers, sell ordinary shares in the market, and follow the lead of companies such as Vickers, Son & Maxim, who kept dividends high in order to induce market confidence. Shares were finally quoted to the public in March 1910.^

The example of this company illustrates the difficulties of raising capital by family controlled firms and the problems of conversion from private to public liability. Indeed, the failure of the shares to find a ready market led the company in 1913 to create £75,000 £1 preference shares which were issued to the Sheffield & Hallamshire Bank in return for loan capital for the construction of a new cogging and rolling plant.^{OA} Furthermore, it fits in with general notions of the divorce of financial and industrial capital in the UK, especially when compared to the growth of investment banks and company promotions in Germany before 1914.^{OA} Indeed, the management of Edgar Allen's looked to Germany as a model, noting the expansion of the large Deutsch and Dresdner Banks, the "flexibility" of the system in providing capital at rates of interest minimally above the "official bank rate of interest", and the employment of experts to provide financial advice to

business on new projects and the mechanisms of raising finance. ^{an}

This chapter has explored the structural features of the iron and steel industry before 1914. The emphasis on the small-scale nature of capitalism is related to the structural characteristics of the industry which are explored in following chapters in relation to the business strategy of the firm. The retention of family control may well have been detrimental to the growth and development of larger business units. Furthermore, the notion of business structure brings forth the ideas of a business system which fostered a defence of the economic interests of the industry at a political level. Sheffield firms were to face increasing competitive constraints from the 1880's, which required an effective response at both the economic and political level. The next chapter begins to explore these constraints in relation to the great depression and the economic crisis of the 1880's.

Notes and References.

1. M. Sanderson, "The Professor as Industrial Consultant: Oliver Arnold and the British Steel Industry 1900-14", *Econ. Hist. Rev.*, vol.31 no.2 (1978), p.586.

2. J.G. Timmins, "Concentration and Integration in the Sheffield Crucible Steel Industry", *Bus. Hist.*, vol.24, no.1 (1982), pp.61-78; "The Commercial Development of the Sheffield Crucible Steel Industry", MA (Sheffield 1976); R. Lloyd-Jones & M.J. Lewis, "Industrial Structure and Firm Growth: The Sheffield Iron and Steel Industry, 1880-1901", *Bus. Hist.*, vol.25, no.3 (1983), pp.260-3.

3. This follows work on the reconstruction of the Manchester cotton

industry by R. Lloyd-Jones & A.A. Le Roux, *The Size of firms in the Cotton Industry: Manchester 1815-1841*, *Econ. Hist. Rev.*, vol.33, no.1 (1980); and the later work by Lloyd-Jones & M.J. Lewis, *Manchester and the Age of the Factory* (1988).

4. Numerous business histories exist for these firms; see C. Trebilcock, *Arms and Enterprise. The Vickers Brothers 1850-1914* (1981); J.D. Scott, *Vickers A History* (1962); A. Grant, *Steel and Ships: The History of John Browns* (1950); J.H. Stainton, *The Making of Sheffield 1865-1914* (1924)~

5. S. Pollard, *A History of Labour in Sheffield* (1959), p.162. By 1900, these firms had diversified into shipbuilding, coal mining and other activities. Timmins, *"Concentration"*, p.73. Also A.E. Musson, *The Growth of British Industry* (1978), p.176.

6. Vickers, Sons & Maxim, ranked 4th, employing 22,500 (8 UK plants); John Brown's, ranked 7th, 16,205 (3 plants); Hadfield's, ranked 70th, 4,000 (2 plants); Cammell, Laird's, 3,950 (5 plants). See C. Shaw, *"The Large Manufacturing Employers of 1907"*, *Bus. Hist.*, vol.25, no.1 (1983), pp.52-3.

7. See G.I.H. Lloyd, *The Cutlery Trades: An Historical Essay in the Economics of Small-Scale Production* (1913), pp.191-4; P.C. Garlick, *"The Sheffield Cutlery and Allied Trades and Their Markets in the Eighteenth and Nineteenth Centuries"*, MA (Sheffield, 1951), pp.61-5, 75-6..

8. D. Smith, *Conflict and Compromise, Class Formation in English Society 1830-1914: A Comparative Study of Birmingham and Sheffield* (1982), p.236.

9. L. Hannah, *The Rise of the Corporate Economy*, (1983), p.10.

10. M. Dobb, *Studies in the Development of Capitalism* (1963), pp. 341-2.

11. Timmins, *Concentration*, p. 75.

12. See bibliography for Rate book sources.

13. See Lloyd-Jones & Lewis, *Manchester*, p.24; Timmins, *"Concentration"*, pp.61-2.

14. This is larger than the population explored by Lloyd-Jones & Lewis, *"Industrial Structure"*, p.261, because firms producing both tools and cutlery have been included, and four additional firms have been added.

15. *Ibid.* p.260.

16. P.L. Payne, *"The Early Scottish Limited Companies, 1856-1895: An Historical and Analytical Survey"*, *California Inst. of Technology, Social Science Working Paper*, no.222 (1978); pp.10-11.

17. *Directory*, 1880 (see bibliography).

18. P. Sargent Florence, *Economics and Sociology of Industry* (1969), p.24.

19. J. Nightingale, *"On the Definition of Industry and Market"*, *Jnl. of Industrial Economics*, vol.27, no.1 (1978), p.35.

20. P. Sargent Florence, *The Logic of British and American Industry* (1961), pp.98-9, defines a consumer good as a good demanded by, and supplied to, a consumer for general use, whilst a capital good is demanded by, and supplied to, firms for use in the manufacture of further goods.

21. Nightingale, *"Industry and Market"*, p.36, claims that "groupings in terms of similar techniques poses constraints, as each firm would be using very similar inputs of labour, raw materials and machinery."

22. However, as Pollard, *Labour*, p.278 shows, the use of skilled labour in the heavy branches was still high even in 1914, representing 60% of total employment in engineering, although by 1933 this had fallen to 32%.

23. P.P., 1886 (c4715), 21, Second Report of the Royal Commission on the Depression of Trade and Industry, p.108.
24. Timmins, "Concentration", p.68. As Garlick, "Sheffield Cutlery", p.78, points out, multi-process firms became increasingly common, although the small, single process unit, remained in large numbers.
25. Lloyd-Jones & Lewis, Manchester, Ch.3.
26. Timmins, "Concentration", p.70.
27. M.A. Utton, Industrial Concentration (1970), p.14
28. For an account of the problems in measuring concentration ratios, see L. Hannah & J.A. Kay, Concentration in Modern Industry (1977), p.64.
29. P. Sargent Florence, The Logic of Industrial Organisation (1933), pp.19-20.
30. The increasing competitive constraints on the industry are discussed in the next chapter.
31. Lloyd, Cutlery Trades, p.192.
32. Rodger's were the largest firm in Sheffield, employing nearly 2,000 workers in 1890 and the firm's history could be traced to 1724. Ibid., p.192; Garlick, "Sheffield Cutlery", p.65; Pollard, Labour, p.132. See Appendix A, Table 4.
33. Garlick, "Sheffield Cutlery", pp.41, 66-7; S. Pollard, Three Centuries of Sheffield Steel: The Story of a Family Business (1954).
34. Lloyd-Jones & Lewis, Industrial Structure', pp.260-262.
35. J. Steindle, "Small and Big Business: Economic Problems of the Size of firms", Oxford Inst. of Statistics, Monograph, no.1 (1945). A common problem facing small firms is to raise finance capital. See, M. Jarrett & M. Wright, "New Initiatives in the Financing of Smaller firms". Nat. West Bank Q. Rev., Aug. 1982, p.40; J. Creedy & P.S. Johnson, "Firm Formation in Manufacturing Industry", Advanced Management Jnl., vol.38, no.1 (1983), p.177.
36. E. Penrose, The Theory of the Growth of the Firm (1959), p.221.
37. A. Marshall, Principles of Economics (1961 edn.), pp.263-4.
38. Ibid., p.263.
39. Lloyd-Jones & Lewis, "Industrial Structure", p.263.
40. RV £579.
41. See forward by W.L. Marsh, in Pollard, Family Business.
42. Sheffield Central Library (SCL), Records of J. Beardshaw's, MD7081 (5), Minute Book, Report by H. Spear, 20 Aug. 1903.
43. P.P., 1889 (165), 13, Third Report from the Select Committee of the House of Lords on the Sweating System, evd. of S. Uttley, p.590.
44. Pollard, Labour, p.132.
45. 57% of the 1901 population of small firms were accounted for by new entrants.
46. The low capital costs of entry, in an earlier period were described by G.C. Holland, The Vital Statistics of Sheffield (1843), pp.26-7, who claimed that "Many of the branches are efficiently conducted with a small capital."
47. Most steel producers, for example, operated a central "steel warehouse".
48. P.P., 1889 (165), 13, p.589.
49. Rate Books 1880, 1901; Directory, 1880, 1901.
50. Lloyd, Cutlery Trades, p.194; P.P., 1889 (165), 13, p.590.

51. The rate books list both owners and occupiers.
52. The rate books suggest that a number of steel producers rented property to other manufacturers, thus indicating that capitalist development was routed through rent as well as production.
53. Sheffield Independent, 1 Jan. 1880.
54. Ibid.
55. Ibid., 3 Jan. 1893.
56. Trebilcock, *Dicker's Brothers*, p.51; Grant, *Steel and Ships*, p.65.
57. SCL, MD7081 (5), Report by H. Spear, 20 Oct.; 20 Nov. 1900.
58. Report of the Committee of Enquiry on Small firms (1971), pp. 1, 22.
59. P.P., 1886 (c4715), 21, p.21. See P.L. Cottrell, *Industrial Finance 1830-1914* (1980), pp.124-5, for an account of company conversions in Sheffield in the 1860's and 1870's, including Vickers, Browns and Cammell's. See Appendix B, Table 2, for a list of quoted companies in Sheffield.
60. R. Lloyd-Jones, "Innovation, Industrial Structure and the Long Wave: The British Economy 1873-1914" *Jnl. of European Econ. Hist.*, vol.16, no.2, p.332. See also P.L. Payne, "The Emergence of the Large-Scale Company in Great Britain", *Econ. Hist. Rev.*, vol.20, no.3 1967; L. Hannah, "Mergers in British Manufacturing Industry 1880-1918", *Oxford Economic Papers*, vol. 26, no.1 (1974); A.D. Chandler, "The Growth of the Transnational Industrial Firm in the US and UK: A Comparative Study", *Econ. Hist. Rev.*, vol.33, no.3 (1980).
61. The retention of partnerships, at least until the boom of the early 1870's, is also demonstrated in the case of Scottish companies. Payne, "Scottish Limited Companies", p.30.
62. See Chapter 6.
63. The retention of private limited status was a direct means of retaining family control in UK firms. See Chandler, "Transnational", p.406.
64. SCL, SJC69, Letter Book 1905-24, S & J to J. Summer, 9 May 1906.
65. Ibid., S & J to J. Summer, 20 May 1906; Notice of Extraordinary General Meeting, 23 April 1907; Memo. Sent to Directors, 18 May 1908; S & J, Balance Sheet, 1909. The cutlery firm of Wostenholme's followed a similar line after incorporation in 1875, increasing capital by £50,000 in 1889 to £150,000, by issuing to existing directors 28,000 £1 preference shares, the remainder called up in Oct. 1907. SCL, Records of Wostenholme's, Wos R142, Memo, and Articles of Association, 1875-1930.
66. SCL, Records of Edgar Allens, Aurora 541(b), Loose Letters, W. Edgar Allen to Tropenus, 5 May 1907.
67. MD7081 (5), 16 Dec. 1893; 13 April; 27 Nov. 1908. See also SCL, Records of John Kenyon's, 244/B1/1, Minute Book, 20 May; 9 June 1909, who used debenture stock to finance loans of £6,000 from the Sheffield & Hallamshire Bank in 1909. That debenture shares were commonly used was emphasised by the Sheffield Chamber, who complained that it led to overvalued stock and no mortgage or debenture stock should be issued for more than 50% of capital assets. As W.T. Ward claimed in 1903, company legislation had facilitated companies "in developing resources", and debentures provided a means of funding which would not, otherwise, have been available, but the security offered should only reflect real assets. SCL, Records of the Sheffield Chamber of Commerce, LD1986 (5), Minute Book 1899-1905, 19 Dec. 1901; Sheffield Daily Telegraph, 31 Jan. 1903. See also

American Machinist, vol.29, 1905, p.962E, who commented on the "fictitious" capital" of many companies.

68. SCL, Records of Cooper Bros., 499/B1/8, Memo, and Articles of Association of Cooper Bros. & Co. Ltd., 22 Nov. 1895.

69. W.A. Thomas, The Finance of British Industry 1918-1976 (1978), p.5.

70. SCL, Records of Marsh Bros, Marsh 105, Papers Concerning Effingham, Marsh Bros, to R.B. Maltby, 19 Oct. 1895; Martha Maltby to Marsh Bros., 1 Nov. 1895; Whightman & Parker (Solicitors) to Marsh Bros., 25 Jan.; 7 Feb. 1896.

71. SJC69, S & J to J. Hydy, 7 Jan.; 18 Oct. 1907.

72. Ibid., S & J to P. Robinson (Sydney), 12 May 1911.

73. Aurora 541(b), R. Woodward to William (Cairo), 18 Feb. 1908; William to Woodward, 27 Feb.; 27 March 1908.

74. For the legal implications of the 1907 Companies Act see Cottrell, Industrial Finance, p.74.

75. Aurora 541(b), William to Woodward, 28 Feb. 1908.

76. Ibid. Even companies who floated shares could experience difficulties in raising additional capital; thus, J.H. Baines, the Secretary of Burgon & Ball argued that when the firm was floated we "expected to have sufficient working capital", however, "We are finding it difficult to finance the company having so much stock ... locked up." SCL, Records of Burgon & Ball, B & B19, Letter Book of J.H. Baines, Baines to W.H. Eyres (Sydney), 1 March 1900.

77. Woodward to William, 27 March 1908.

78. Woodward to William, 30 March 1908; William to Woodward, 30 April 1908.

79. William to Woodward, 27 May 1908; Memo, for William, 31 March 1910.

80. Woodward to William (London), 19 May 1913.

81. For a discussion of the link between finance and industrial capital in German development see, R. Tilly, "Mergers, External Growth, and Finance in the Development of Large-Scale Enterprise in Germany", Jnl. of Econ. Hist, vol.42, no.3 (1982).

82. Aurora 541(b), Memo, for Woodward, 5 May 1910.

Economic Change, the Constraints to Growth, and the Crisis of Sheffield in the 1880's.

This chapter firstly analyses the constraints on British business development in the wider context of general studies of the performance of the overall economy in the period 1870-1914. It will then be argued that these constraints became apparent to Sheffield businessmen in the 1870's and 1880's, the first two decades of the so called great depression era. In the context of Moss's theory of business strategy, outlined in chapter 1, what were the competitive pressures facing Sheffield firms in this period and what were the constraints on growth and development? Furthermore, it will be argued that Sheffield producers, during the 1880's, perceived a growing economic crisis at the local level related to a changing economic environment and problems of overproduction. As a starting point, a brief summary of the so called great depression era is provided, emphasising the key role of the staple iron and steel industry to Britain's overall industrial performance.

Floud has remarked that it was an era when, it is claimed, "Britain lost the unchallenged position it had gained as the first industrial nation."^ This is reinforced by Lloyd-Jones who claims that the "period witnessed the so called Great Depression and the British climacteric, and was an era too when Britain faced fierce international competition both economically and politically." Issues such as the Great Depression and the British climacteric have brought forth a

barrage of quantitative data both for and against,[^] and indeed the period leading up to 1914 has now "become as popular as the classical industrial revolution as a field of scholarly study.

At the macroeconomic level, the economy was prone to violent short-run fluctuations[^], and problems on the demand side of the economy led to the possibility of overproduction. The whole concept of a Great Depression relates to the alleged slowing down of the British economy in the last quarter of the nineteenth century. For example, Crouzet, using data for G.N.P., indicates "a long phase of deceleration and distinctly slower growth than before from the early 1870's, with some recovery in the 1890's, but renewed slowing down at the beginning of the twentieth century.[^] The most recent quantitative analysis by Greasley partially supports Crouzet's contention. He concludes that, "the traditional Great Depression years, 1873-1896, while not marking the climacteric, do represent a phase of significant lower growth and "Saul's ... banishment of the Great Depression from the literature may have been hasty", although the claims of a post-1899 climacteric is "misleading since growth appears strong" during the 1907-1913 cycle."⁸

Greasley's estimates for real compromise GDP show a marked slow down in growth rates after 1873; from 2.55% per annum c1865-73, to 1.53% and 1.70% c1873-82 and 1882-9.[^] This slower overall growth is also related to the claim of slower

productivity growth in this period. Indeed, not only did output per head slow down in the last quarter of the nineteenth century but it "began to lag relative to latter day industrialising contries."-^ This was particularly the case in the growth of industrial production and productivity as shown by the comparative estimates in Table 3:1.

Table 3:1: Average annual Growth Rates in Industry 1860-1913

Country	Industrial Production (%)	Industrial Productivity (%)
UK	2.1	0.6
Germany	4.7	1.5
USA	4.1	2.6
France	3.1	N/A

Source: S. Pollard, Britain's Prime and Britain's Decline: The British Economy 1370-1914 (1989), p.12.

As one would expect, there was a dramatic fall in Britain's share of world manufacturing output as a consequence of slower industrial productivity.-^ However, although Britain's relative decline is unmistakable she was still the worlds largest industrial producer in 1913 and "what was significant for Britain was her position as an exporter in a competitive environment." Of more concern was the fact that Britain's share of exported capital goods, "possibly containing the products of the more advanced or progressive industries showed an even more dramatic fall",-^ as shown it Table 3:2. Nevertheless one could interpret the data in a more optimistic fashion and Pollard claims that for a country with a smaller population Britain still held the largest share of manufactured exports and this in itself "was a not inconsiderable achievement."-^ According to Pollard, the macroeconomic

evidence for industrial growth is in itself not sufficient to determine the exact turning points in economic performance, and he advocates a closer examination of sectorial changes in the economy.^4 In particular, Britain's staple industries have undergone far reaching examination by economic historians and, according to Elbaum and Lazonick, structural change to fast growing new sectors of industry was slow to develop and in any case in "the pre-World War 1 years the staple industries remained economically preponderant."-^

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Table 3:2: Share of World Exports of Capital Goods 1800-1913.

Country	% Share of Exports		
	1800	1899	1913
UK	63.1	44.4	31.3
USA	5.7	22.2	20.8
Germany	19.0	17.2	30.1
Rest of World	12.2	16.1	17.8

Source: Pollard, Britain's Prime, p.14

The performance of Britain's staple industries is therefore crucial to the debate on Britain's pre-1914 economic performance, and particular attention has been drawn to the iron and steel industry and its related branches. The performance of this industry has been a focal point for studies which have emphasised industrial ~~decline~~-^ and its role as a dynamic agent of expansion in the mid-Victorian period, its position "as a status at home and abroad, and its significant contribution to Britain's export performance"-^ have all received considerable attention. Thus as McCloskey informs us,

the British iron and steel industry "has to a special degree encouraged generalisations concerning the economy as a whole". What then was the overall economic performance of this sector and what were the constraint changes it faced c.1870-1914?

The evidence for growth rates in the iron and steel industry clearly indicates a marked slowing down after 1870, which fits the evidence for a retardation of overall British growth rates. After making "regular" but "unspectacular" progress in the 1850fs and 1860's the industry witnessed boom conditions between 1869 and 1873, which was largely due to the enormous increase in exports. At this date, the industries share of national product reached its peak, and thereafter there was a serious slowing down in the growth trend "during the last quarter of the nineteenth, and beginning of the twentieth century." The contribution of the iron and steel industries gross production to UK GNP fell from a peak of 12% in 1871 to 5.4 % by 1907.¹⁹

In terms of production trends, the new dynamic after 1870 was the rapid substitution of steel for wrought iron.²⁰ Nevertheless, the problem was again one of relative decline in the face of growing competitive pressures from US and German producers. Elbaum, surveying the pre-1914 British steel industry, claims that it had "surrendered world leadership and entered a spiral of competitive decline from which it has never fully recovered. Britain's share of world tonnage output in

1870-4 was 47.6% for pig iron and 43.9% for steel, however, by 1910-14, despite rising domestic production, this had fallen to 14.9% and 10.8% respectively. Britain was overtaken by the USA in 1886 and by Germany in 1893; by 1900, both were producing three times the steel tonnage of Britain.⁹⁹ Furthermore, Britain, by 1913, had become a major importer of steel products. In 1913, 41.0% of British production was still exported, thus the industry was still firmly locked into the international economy, but now stagnating exports was accompanied by rising imports and Britain was importing over 2 million tons of iron and steel products compared to just over 0.2 million tons in the 1880's. By 1913, imports accounted for approximately 29.0% of Britain's domestic consumption of wrought iron and steel.⁹³

As Harley and McCloskey note, by 1900, foreign steel imports were becoming increasingly evident in Britain, and was a source of major concern to businessmen who felt that "Surely something had gone wrong. That something fundamental had gone wrong was evidently the concern of those businessmen who sat on the unofficial Tariff Commission of 1904. In terms of the iron and steel industry they concluded with a note of warning that,

The evidence shows that we are only at the beginning of the era of foreign competition, that that competition is certain to become more and more severe, and that to maintain the British iron and steel industry in a state of efficiency, strenuous efforts are absolutely necessary.

Competition thus placed a clear constraint on business development which called for the formulation of a decisive strategy by businessmen.

A whole plethora of explanations have been put forward to explain the failings of the British iron and steel industry; these range from inferior entrepreneurship and lack of technical training,⁹⁶ chaotic industrial relations,⁹⁷ to demand and supply constraints⁹⁸, and institutional factors such as the government's retention of free trade in a market prone to dumping and exclusion from traditional markets by high tariffs.²⁹ These factors relate to Moss's constraints outlined in the last chapter, the development of the industry was constrained by both resource and market factors. In terms of the development of the industry's physical technical resources, it has been claimed that the steel industry had a high innovatory potential but lagged in the introduction of new techniques by 1900. w According to one estimate, German and US steel producers were 15.0% more efficient in productivity by 1905-09 than their British counterparts.^ In particular, the failure to rapidly introduce new mass production techniques placed the industry in an inferior competitive position by 1914.⁹⁹ As Coleman and Macleod claim, the "unenthusiastic attitudes" shown by a majority of UK businessmen towards new technology "had long and tenacious historical roots.

Of course these views have not gone unchallenged. For example, Sandberg argues that the causal links between

entrepreneurial failure, technological backwardness and the weak performance of the economy is problematic.^ ^ Similarly, McCloskey claims that late Victorian Britain did not fail because the expansion of output depended upon how productively the available resources in the economy were utilised. Thus, British entrepreneurs are redeemed on the grounds that they performed well given the test of cost minimisation subject to prevailing constraints.^ ^ There is of course a compelling logic to these arguments, however, it ignores the underlying dynamic of capitalism, in particular the ability of entrepreneurs to adequately respond to the prevailing constraints. Thus, for example, Elbaum and Lazonick turn McCloskey's argument around; the British "problem was that economic decision makers, lacking the individual or collective means to alter existing constraints, in effect took them as given." Although aware of the constraints facing them, "British businessmen failed to confront institutional constraints innovatively, in particular the retention of small-scale business structures in a political economy of free trade which protected faster growing foreign markets.^{o7,}

These constraining factors form the basis for exploring developments in Sheffield's iron and steel sector and are analysed in detail in future chapters. However, for Sheffield businessmen the 1880's was a decade when they began to perceive that, indeed, something had gone wrong, and the trade witnessed a growing economic crisis which was to shape their economic and

political response in the following years. At the heart of this crisis was the declining competitiveness of Sheffield industry. Changes in the external environment thus focussed business attention on the cost and structural problems of the industry, and demanded a positive response to constraints related to the resources of the firm, and the changing political environment which saw the industry develop in an age of rising protective barriers.

In January 1880, The Engineer presented a gloomy account of the present and future prospects of the metal trades of Great Britain. The "depression hung like a black cloud over the country ...Hope and with it speculation were alike dead." This crisis, it was argued, was directly related to Britain's declining export performance, where "Foreign competition in our principle and best markets seemed to have gained an hold which would never relax. These views were echoed by the Sheffield trade where, in the severe recession of 1879, there were "loud complaints" by heavy steel and engineering producers "as to the depression in business. The short-term cyclical nature of the depression, which affected different sectors of Sheffield industry periodically, was evidently recognised by the business community. For example, The Engineer reported, in January 1880, that heavy rail producers in Sheffield were "well employed" and had substantial contracts for Indian, Australian and UK markets. The demand for heavy engineering products, although still low, showed sufficient improvement to indicate that

British producers "still hold the chief command in those foreign markets which are not supplied by native sources", particularly colonial markets. On the other hand, however, competition in the lighter staple trades of Sheffield was intense and cutlery and small tool producers had little demand for their products.^

The "partial nature" of the trade revival, largely confined to the heavier trades, and stimulated by a large upturn in demand from the USA for Bessemer steel and rails, was also commented upon by The Sheffield Independent. The demand stimulus to the heavy sector, it was argued, would in turn engender a revival of demand for cutlery and other fabricated products.^ The major factor in this revival was US demand,^ and replying to comments in the USA, that Britain no longer "had a permanent footing in the American market", the Independent optimistically remarked that Sheffield still held its competitive advantage: "prices are cheaper here and America will buy iron, rails and steels ... as they have done in the past." However, they also registered a note of concern to the fact that US steel producers had now resumed operations at an "increased capacity.!!Z^

That US competition had seriously affected Sheffield's competitive position in the depression of the 1870's is illustrated by the Independent's attack on the US practice of dumping:

Another result from American activity and high rates will

be that we shall hear far less of their competition in foreign and neutral markets, than during the period of stagnation, they no longer having any inducement to clear out stocks at ridiculously low prices. ^

This clearly indicated, that US producers were already encroaching on Sheffield's traditional foreign markets in the 1870's, responding to the depression by maintaining output, stockpiling and then flooding the market at marked down prices, thus further depressing prices. Certainly, the depression from the mid-1870's was reflected in falling prices for iron and steel products.^ For example, prices for steel products fell sharply during the 1870's by as much as 60%. The major factors responsible for this was intense competition amongst steel producers for new markets, falling costs as economies of scale and improvement innovations began to work themselves out, and the locational shift of steelworks to cheaper coastal sites to reap the advantages of low cost foreign ore imports.

According to the Independent, the trend of falling prices had restricted trade and led firms to pursue a strategy of output contraction and the running down of accumulated inventories.^ However, although the revival in US trade had brought a rise in prices,⁴ the Independent warned against "reckless speculation" as trade revival had been induced by the very fact that prices had fallen to a minimum point which was exceptionally low.^ That such a warning was not heeded by iron and steel producers was exemplified by a survey of the industry's trading performance in the Economist of December 1880. Towards the close of 1879, trade suddenly emerged from "a

prolonged depression ... into a condition of feverish activity", with a large increase in demand from the USA, and the increase in production has "exceeded anything known in trade." However, the Economist noted that a great proportion of this increased business was purely "speculative" which created serious losses for producers when US trade fell off from May 1880.⁵⁰

The transitory nature of the US trade revival thus dictated that business should pursue a cautious approach to capacity expansion. Therefore, in terms of Moss's concept of business strategy, market uncertainty may well have created a cautious business response to the upturn of the trade cycle in 1880. Indeed the initial response by Sheffield's heavy steel and engineering producers was fairly conservative. For example, the price of steel rails increased from £4..12s..6d in October 1879 to £8..10s..0d by January 1880, however the precarious and uncertain business environment convinced many firms to decline committing themselves to large contracts.[^]

This caution may well have been justified, given that by mid-1880 the heavy trades were again reported as depressed, the engineering trades were short of orders "and workmen have again been placed on half time." - [^] for example, the large foundry and engineering firm of Davey Bros. Ltd., reported to its shareholders in July 1880 that they were operating at "undercapacity" due to falling orders and "unremunerative prices".[^] The 1880 rate book provides an estimate of

underutilised capacity, with 5 firms recorded as wholly empty and 24 as partly empty, with a total RV of £5,890, or 4.4% of the total RV for 1880. However, large firms such as Vickers and Firth's were operating below full capacity, the former with 24% of the total RV empty, and the latter with 5%.^ Trade remained "dull" until August 1880 when the engineering trades reported an upturn in trade largely from domestic sources as the shipbuilding trade revived leading to an increased demand for ship-plate. Furthermore, by October 1880 the cutlery trades were finally responding to the stimulus, given by the heavy sector, resulting in a large increase in foreign orders mainly from the Australian market.

The precarious and uncertain nature of the trading environment is evident from the above analysis of the upturn in the trade cycle in 1880. In particular the vagaries of the US market created considerable fluctuations in demand. This was certainly evident in the 1870's as emphasised by the example of the large Sheffield steel and tool firm of Samual Osborne & Co. This firm rapidly developed Mushet's special tool steel after 1868, gaining a reputation in the US market by 1872. However, the Company soon found, as did other Sheffield producers, that the US market had its dangers, and financial fluctuations in the US in 1874 brought the company to the brink of bankruptcy in 1874.^ In 1886, Samual Osborne advocated an expansion into new markets, to relieve Sheffield firms of the "capricious" nature of the US trade, in which upturns in demand placed

immense pressures on the productive resources of the firm, while downturns resulted in the complete stoppage of production. As he succinctly put it: "Once when American trade is bad the whole of Sheffield is distressed.

The "mild boom" of 1880 to 1883 collapsed in Sheffield at the end of 1883 leading to a severe depression in 1885 and 1886.-^ Again, economic recession in the USA towards the end of 1882 marked the end of the upturn in the short cycle. The persistence of these cycles was emphasised by Fredrick Brittain, a steel manufacturer and fair trader, in 1886, ~~to~~^{to} who argued that "eight years ago we were told that the depression was only temporary ... I pointed out at the time that the depression in other countries was produced by different causes and that it had varied in intensity." The overwhelming cause of the depression, according to Brittain, was "foreign competition assisted by protective tariffs. The link between foreign competition and depression was also prominent in the evidence of Sir Lowthian Bell, the President of the Iron trade Association, to the 1886 Royal Commission:

foreign countries have largely increased their powers of production in late years, more largely than has been the case with ourselves, and they are in consequence formidable competitors with us not only in their own territory, but in neutral markets.

The realisation of increased foreign production and competition was prominent in the evidence presented to the Commission by Sheffield businessmen connected with a wide range of the cities iron and steel trades. For example, James W.

Dixon, an electro-plate and Britannia metal producer, claimed that his own business was "in a very depressed state" and generally he "had never known trade so bad in Sheffield. Another witness, Charles Belk, giving evidence relating to the cutlery trades, laid the blame for the decline in the output of table cutlery squarely on "foreigners taking the business. However, the depression was not only prevalent in the lighter trades, but also in heavy engineering. J.D. Ellis, the chairman of John Browns, complained of a general depression in the heavy engineering trades, the loss of "nearly all our old foreign markets", in consequence of the larger production methods and improved processes "which have been fostered by the tariffs which have been put on."

That tariffs were a central cause of the depression was reinforced by T.E. Vickers, who, referring to the once lucrative trade with the USA, complained that high US import duties⁰ had virtually decimated their trade in bar and sheet steel, and railway materials, the firm's exports declining from £83,000 to £4,000, c1864-85, and £100,000 to £1,000, c1873-85 respectively. According to Vickers, the crucial factor in eliminating Sheffield from this market was the prevailing US tariff structure which induced US producers to increase the scale of operations as "The Americans could make a very large profit when we could just sell with a bare profit, or at cost price, and, therefore, they extended their works." Thus tariffs acted as a constraint on investment decisions relating to the

expansion of business activity.^{c7}

Similar arguments abounded amongst businessmen in the lighter Sheffield trades. Dixon complained of high tariff barriers in the USA, Canada, France, Spain, and Russia which was hampering the development of new lines of trade; and Osborne claimed that the once lucrative file trade with the US had been severely impaired by the US tariff, making the cost of files in New York double the selling price at Sheffield.^{Cg} Clearly, in terms of cutlery exports there was a dramatic reduction in Sheffield's trade with the USA in the 1870's and 1880's which, after a brief revival in the late 1880's, continued apace up to 1910 (Appendix B, Table 1). A similar collapse of Sheffield's export trade in files to the USA is also apparent, declining from £121,000 in 1868 to £11,000 by 1879, to a mere £180 in 1902.^{^9} Furthermore, as shown in Table 3:3, by 1900 Germany had surpassed Britain as the world's leading cutlery exporter.

Table 3:3: Cutlery Exports by Country (Millions of Marks).

	1900	1906	1913
Germany	16.1	24.1	38.3
UK	12.8	14.1	16.7
France	4.2	5.4	6.3a
USA	1.2	2.3	4.6

Notes: a. Data for 1912.

Source: Pollard, Britain's Prime, p.45.

That adverse changes in tariffs could create business uncertainty is illustrated by the response of the management of the large cutlery firm of George Wostenholme's to the imposition of the McKinley Tariff in 1890. The management

claimed that the capital value of the Sheffield works depended on the maintenance of the US trade and in view of "growing tariff agitation" it was prudent, in addition to annual capital depreciation, to meet the probable depreciation from the decrease of the US trade by increasing the depreciation fund by 20%.^ This evidence would seem to support the contention that Sheffield producers were constrained by the limitation of export demand in the face of the high tariff policies of her major competitors, Germany and the USA. Indeed, as Edward Beckett, the US agent for Wostenholme's, informed the directors in 1893, if there was a substantial reduction in the US tariff, American importers "will do all they can to push our goods" and "we shall sell more goods than ever." High US tariffs, claimed Beckett, deterred US importers ordering cutlery in bulk batches thus reducing the company's ability to enter the market on a large enough scale.^ However, the problems facing Sheffield producers in the 1880's went deeper than this and was rooted in a fundamental crisis of overproduction.

In terms of the problems faced by individual business firms, Sweezy has claimed that "Each capitalist produces for a market the size of which he can only estimate on the basis of very incomplete knowledge, with the result that now too little, now too much is produced. Thus, it is possible for supply to exceed demand and "because the aim of production is to expand value, production will be held back as the value

embodied in the commodities cannot be realised on the market. This therefore postulates the possibility of a realisation crisis whereby a decline in profitability, which sets the crisis in motion, results from the inability of capitalists to realise the full value of the commodities they produce.

Can such a perception of crisis be related to the 1880's? If we accept the viewpoint of McCloskey then the answer is no. McCloskey firmly rejects the possibility of problems of overproduction at the national level in the late Victorian period clinging steadfastly to the undying virtues of Say's law.[^] However, even if we accept this at the macro level, and it is still a problematic issue, it denies the possibility of a crisis at the local level and within industrial sectors of the economy. Furthermore, McCloskey's theoretical base, located within the static parameters of neo-classical economics, denies the dynamic environment in which firms operate, an environment which, as argued in chapter 1, was subject to constant fluctuation and change.

Lowthian Bell located the causes of the depression in a combination of both excess production, relating to capacity expansion, and a diminuation in demand:

It has sometimes been due to the one and sometimes due to the other; but at the present moment there has been a diminuation in the make of iron in this country of something like a million tons a year: but the falling off in the demand as been more than that. [^]

He further argued that the depression was more than simply a downturn of prices after a short period of inflation, in 1872-3, because the cost of production also increased substantially. Given the high labour intensity of iron production, the price of labour rose with the price of iron in the inflationary boom of the early 1870's "to such an extent that ... the cost of pig ... and all kinds of iron rose, to double what it was in former years." However, when prices fell workers rejected wage cuts, and in consequence capitalists continued to pay high prices for labour, "long after the period when we could no longer afford it." The constraint of rising wages and falling prices thus adversely affected the competitive position of the British industry vis-a-vis her major competitors.⁷⁵

That overproduction had affected the Sheffield trades was referred to by the Sheffield Chamber of Commerce. Claiming it was a natural reaction following a period of inflation, the Chamber pointed to the fact that businessmen were now faced with falling prices, falling demand and keen competition for limited orders.^ Belk, referring to the cutlery trades, argued that insufficient demand and intense competition had made trade "unremunerative ... and were capital not already so largely and immovably fixed in the permanent appliances of the trade much would be withdrawn, and other channels sought for its profitable employment." Thus, according to Belk, the depression was the consequence of "a general failure of demand" which had extended throughout the whole country.⁷⁸

Overproduction was thus related to a problem of demand, but was the problem supply orientated as well as demand orientated? In other words, was overproduction also related to capacity expansion during the boom of the late 1860's and early 1870's? The 1860's was a period of abnormally rapid capital accumulation and witnessed a substantial increase in the productive powers of industry particularly in the capital goods sector. For example, the world output of pig iron increased by 60% c.1866-1872 and Britain accounted for nearly half of this increase. Capital investment in iron works is estimated to have trebled and in mines doubled between 1867 and 1875.^

In Sheffield, the production of crucible steel expanded rapidly in the late 1860's and early 1870's. The leading producers, Vickers, J.A. Andrews, Firth's, Sanderson's, and Jessop's increased their melting capacity substantially and by the early 1870's these five firms accounted for approximately half of Sheffield's crucible steel output. Indeed, this marked the peak of Sheffield's crucible steel production, output being approximately 100,000 tons per annum.^ As Pollard point out, "The years 1870 to 1873 saw the greatest boom of the century among the heavy industries." In 1871 Brown, Bailey & Dixon established new works to employ over 1,000 workers, Cammell's expanded their Cyclops works to employ an additional 800 and the Atlas works of John Browns were expanded employing a further 1,000. In addition, J.H. Andrews erected a new steel works and Vickers invested substantially in a new rolling mill.

However, this expansion in capacity was not limited to the larger concerns and there were "many additions to smaller firms.

This expansion of capacity led to serious problems of overproduction when demand fell after 1873. Trade generally improved after late 1879 with a mild boom to 1883 leading to the severe depression of 1885 and 1886.^ The world-wide overproduction of iron and steel, due to the rapid expansion of these sectors in the 1860's and early 1870's, led to fundamental problems in the 1880's. For example, the Engineer in January 1880, referring to the increased demand for railway material in the Sheffield district, urged caution because "despite the increase in prices ... it is possible that if advances continue to be made with such rapidity ... production may again be stimulated to overproduction from which the United Kingdom has severely suffered.

Similar problems were encountered in the lighter sectors. Pollard claims that "The depression of 1874-9 was of a severity unknown for a generation", conditions improved between 1880 and 1883 but the revival did not witness "the full use of resources, the high profits, or the strong trade-union bargaining position of previous booms. This would suggest that each successive recovery phase was conditioned by lower levels of economic activity and unutilised production resources. However, in the 1880's the productive capacity of the light trades was increased by the introduction of labour

saving techniques beyond even the high output of the 1870-1873 boom. As Belk informed the 1886 Commission, "The introduction of machinery has largely increased the productive powers of some of our staple trades"^ Thus in the slump of 1883-1886, although output did not fall to the levels of previous recessions, excess capacity caused prices, profits and wages to drop dramatically. Trade revived towards the end of 1886 and continued on the upgrate until the beginning of 1892 when a new recession set in.⁸⁸

The crucial point here is that although production could be increased through mechanisation and labour displaced⁸⁹ the increased output still had to be realised. As Belk argued, the depression had stimulated the invention of labour saving machinery, allowing them to maintain the gross volume of trade, but there had been a marked decrease in the money value as intense competition, especially in the foreign introduction of low quality machine produced goods, "had driven down prices and seriously reduced profit margins. Therefore, the problem for the light trades was perceived as a general lack of "vitality in demand"*^ leading to overproduction and a realisation crisis for Sheffield producers highlighted by falling profit margins.

Market fluctuations could thus create financial difficulties and lead to business uncertainty. This can be illustrated by the experience of two prominent Sheffield firms in the heavy sector, the Yorkshire Engine Co. Ltd. and Brown, Bailey & Dixon Ltd. In the first case, the Company (RV £750)

was promoted as a new venture by the Manchester based accounting firm of Chadwick, Adamson & Collier in 1864, with a nominal capital of £200,000., reduced in 1867 to £163,000. In July 1880 the firm was wound up after potential investors had provided only £7,000 of an expected £40,000 injection of new capital. The misfortunes of the company were directly attributable to large investments in plant and equipment for the production of locomotives which had proved largely unremunerative. In the late 1870's, the firm faced 'severe competition in the locomotive trade, for which most of its plant is laid, and labouring under private burdens and insufficient capital it ... led eventually to its winding up.' The company was dissolved in 1880 by which time the nominal capital of £163,000 had depreciated by £153,000, leaving only £10,000 of original capital.^

The financial problems of Brown, Bailey & Dixon are even more striking given the large size of this concern. The firm was converted to a private limited liability company in 1873 and produced Bessemer steel, railway equipment, steel forgings and light tools. In 1880, the firm occupied the extensive "Sheffield Steel Works" in Attercliffe rated at £6,893 and had expanded rapidly in the 1870-1873 boom employing an additional 1,000 workers in this new plant. However, in March 1880 the company's annual report disclosed a loss of £10,000 on the years operations and by early 1881 the firm's liabilities were £263,802 compared to assets of only £120,246, leading to the

"shocking news" of the firms voluntary liquidation. The company's declining fortunes were linked to a physical resource constraint related to the increasing price of pig iron in 1880, which the firm largely purchased from outside. This in turn adversely affected the cost structure of rail production entailing a considerable loss on the manufacture of steel rails "although a profit had been made in other branches.

However, this was interwoven with a declining market for Sheffield rail products. In November 1880, Engineering reported that Sheffield rail producers had been severely hit by increased competition from the Continent, manufacturers subscribing "to any conditions of delivery which local producers are not." The essence of this argument was that Continental manufacturers were undercutting Sheffield rail producers in their own market and the journal concluded that the rail trade "is passing through a crisis in which the workmen are suffering. Clearly, however, from this example it was not only workers who suffered from the competitive environment facing the rail trade in this period.

That iron and steel firms suffered a squeeze on profits is also evident on a more general level. Profits for ironworks in the UK fell from a peak of £7.3 million in 1875 to a low of £1.7 million in 1880 and recovered only slowly up to 1884 (Appendix B, Table 2). In the case of Sheffield firms, share values of publicly quoted companies provide some evidence to substantiate a general decline in profitability and also

indicates the fluctuating nature of the investment market. Between 1875-78, the market value of shares of local firms, on which £7.5 million had been paid, had depreciated to £5million.^ The revival of trade in 1880 brought about a more bouyant investment market leading to an increase of £2 million in the share value of Sheffield limited companies. Furthermore, the nominal capital value of 16 leading Sheffield limited companies increased from £3,971,541 in August 1879 to £6,242,603 by January 1880 and this indicated an encouraging trend "especially as investments are so largely connected with the industries of the town ... commercial men have a knowledge of what is the course of trade."^H John Browns, for example, reported that owing to intensified depression during the last six months no interim dividend was to be paid, but "profits are now revived and we hope for better in the second half of the financial year."^

This optimism, however, was short lived, share values again collapsed with the downturn of trade after 1883. A survey of 44 limited companies by the Sheffield Telegraph in 1885 showed a net depreciation of £750,000 on the market value of shares during 1883. During 1884, 13 quoted companies showed an increased value above paid up capital of £1,603,056 while 31 companies showed a depreciation of £3,654,318. and during 1885 alone, the share value of Sheffield limited's fell by some £2 million.^ It was possible to identify 18 of these firms as being engaged in iron and steel operations in Sheffield and

market valuation data for 1886 and the companies RV in 1880 is given in Appendix B, Table 3. With the exception of four companies, there was a marked depreciation in the market share values of 13 companies, one remaining constant.

These data suggest a general squeeze on profits and as the Telegraph noted in December 1885,

Three leading features mark the local trade for the year which, for all commercial purposes, has now practically expired ... a fair volume of trade generally, narrow margin of profit, and increasing severity of competition both at home and abroad. Prices have ruled very low and the revival which was anticipated ... has not taken place. °

Profit figures for individual Sheffield firms are of course difficult to come by, however, the data in Appendix B, Tables 4-5 provides profit and loss figures for three firms over various time periods. The data for Wostenholme's show a severe dip in profits in 1885 but the data for Coopers do not cover the 1880's. However, the profit figures for Ibbotson's are more wide ranging and show clearly a marked downward trend in net profits from the mid-1870's to 1881, an upturn to 1886 though profits remain below the level of 1872.

This chapter has argued that Sheffield producers faced a growing crisis in the 1880's related to growing foreign competition, and problems of overproduction which were, in turn, related to the constraint of limited market demand in a changing competitive environment. These problems were again to manifest themselves in the severe recession of 1892 as indicated by the profit data in Appendix B. However, the rise

of Germany and the USA in the 1880's suggested to Sheffield businessmen that something indeed had gone wrong. As Pollard argues, by 1900 the problems facing British industry were far more serious than the 1880's, more industries suffered from foreign competition and "economic growth in general and industrial growth in particular, far from accelerating, came to a virtual standstill".^ These problems were all too clear to Sheffield businessmen by 1900, and we now turn to the response of Sheffield businessmen to the changing economic environment c1880-1914.

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59. Saul, *Overseas Trade*, p.103.
60. Fredrick Brittain, was a partner in the family concern of S.S Brittain, steel and tool producers, RV, 1880, £150. See Chapter 7 for a discussion of his role in the tariff reform debate.
61. F. Brittain, *Sham Free Trade: What it has done for England* (1885), pp.4-5.
62. P.P., 1886 (c4714), 21, p.47.
63. Ibid., p.19. J.W. Dixon was a partner in the large cutlery firm of J. Dixon & Sons, RV, 1880, £928. In 1886, he was Chairman of the Sheffield Chamber of Commerce.
64. Ibid., p.77. Belk was Master Cutler in 1886, and a partner in Roberts & Belk, cutlery manufacturers, RV, 1880, £82.
65. Ibid., p.99.
66. The US import duty was increased in 1883. Board of Trade. *Memorandum, Statistical Tables and Charts Relating to British Foreign Trade and Industrial Conditions* (1903), pp.5-6.
67. P.P., 1886 (c4714), 21, pp.108, 111.
68. Ibid., pp.19-20, 105.
69. G.I.H. Lloyd, *The Cutlery Trades*, (1913), p.482.
70. SCL, *Records of Wostenhoime s, Wos R144*, Minute Book, July 1890.
71. SCL, Wos R12(e), *Journey Reports of E. Beckett*, Beckett (New York) to Wostenhoimels, 23 June 1893. See also W.P. Field (Louisivile), to Beckett, 17 March 1893, informing him that "should the ad valorem duty be lowered to 35% and the specific duty vanished all together we would never be able to keep up with orders."
72. P. Sweezy, *The Theory of Capitalist Development* (1970), p.156.
73. R. Campbell, *Capitalism in the UK T_A Perspective from Marxist Political Economy* (1981). pp.50-1.
74. As McCloskey, 'Victorian Britain', pp.448-9, claims, "in the situation of the Victorian economy, it is more plausible to assume that supply created its own demand than that demand would have created its own supply."

75. P.P., 1886 (c4714), 21, p.41.
76. Ibid., p.40.
77. Ibid., p.407.
78. Ibid., pp.75, 77.
79. M. Dobb, *Studies in the Development of Capitalism* (1963), p.302; E. Hobsbaum, *Industry and Empire* (1969), pp.116-7.
80. J.G. Timmins, 'Concentration and Integration in the Sheffield Crucible Steel Industry', *Bus. Hist.*, vol.24, no.1 (1982), p.72; Tweedale, *Sheffield Steel*, p.87.
81. Tweedale, *Sheffield Steel*, p.27.
82. Pollard, *Labour*, p.163.
83. Ibid., p.164.
84. *The Engineer*, vol.49 (1), 1880, p.12. Similar caution was urged in the upturn of demand in 1905 by R.A. Hadfield, who claimed "they did not want booms but a continuous steady demand." *American Machinist*, vol.29, 1905, p.846E.
85. Pollard, *Labour*, p.126.
86. Ibid., p.126.
87. P.P., 1886 (c4714), 21, p.76.
88. Pollard, *Labour*, p.126.
89. Between 1880 and 1892, the introduction of machinery had reduced the employment of file forgers by 30%, pen and pocket blade forgers by 20%, engineers tool makers by 50% and tableblade forgers by 60-70%. Ibid., p.127.
90. P.P., 1886 (c4714), 21, pp.75-6.
91. Ibid., p.84.
92. Chadwick was prominent in the conversion of Vickers, Browns, and Cammell's, in consequence of their adoption of Bessemer production. P. L. Cottrell, *Industrial Finance 1830-1914* (1980), pp.124-5; *Engineering*, vol.30, 1880, p.91.
93. *Engineering*, vol.29, 1880, p.228; vol.30, 1880, p.625; vol.31, 1881, p.46; *Sheffield Daily Telegraph*, 29 Dec. 1880; Pollard, *Labour*, pp.162-3; C. Erickson, *British Industrialists. Steel and Hosiery* (1969), p.208.
94. *Engineering*, vol.30, 1880, p.468. The company was rescued by the "good will of the creditors, who accepted a repayment of 6s 8d in the £, the firm being transferred to the shareholders as "a going concern". The firm resumed operations as a private limited in 1882, and was quoted publicly in 1888 under the new title of Brown, Bailey Steelworks Ltd. *Engineering*, vol.31, 1881, p.515; Erickson, *Steel and Hosiery*, p.208.
95. Pollard, *Labour*, p.164.
96. *The Engineer*, vol.49, 1880 (1), p.19; *Engineering*, vol.29, 1880, p.5.
97. *Telegraph*, 26 Dec. 1885; P.P., 1886 (c4714), 21, p.18.
98. *Telegraph*, 26 Dec. 1885.
99. Pollard, *Britain's Prime*, p.238.

Businessmen and Change: The Resource Response of Sheffield Firms, 1880-1914.

The theory of business strategy, developed in Chapter 1, provides the framework for an examination of how the firm responds to competitive constraints. This chapter will concentrate on the resource response, which involved the restructuring of the firm's physical and human resources, in particular the introduction of mechanisation to the manufacturing process. In other words, investment strategies are determined by the existing resource mix of the firm and imbalances in the production process may well focus managerial attention upon particular objectives which entail the elimination of these imbalances. Furthermore, competitive pressures facing the industry provide an example of Moss's inducement effect, whereby external factors focus managerial attention on new methods and techniques of production. But how successful were firms in meeting the challenge of competition? Particular reference is made to cutlery, where it is argued that labour resisted mechanisation and attempts to increase productivity, and the structure of the industry militated against the successful introduction of new techniques and work practice.

In January 1880, the Engineer, referring to intense foreign competition, criticised British engineers for a lack of ingenuity and called for a more efficient use of human

resources in the production process: "At this moment more than ever is the employment of machinery to take the place of hand labour a necessity."^ This statement had particular reference to Sheffield's cutlery and tool trades. Indeed, according to Charles Belk, in 1886, depression and competition provided an inducement to the introduction of new techniques, "as it keeps us alive to the progress that others are making, and prevents us ... resting content with the appliances that were sufficient in years gone by."^ Similarly, in 1902, W.F. Beardshaw, referring to the severe downturn of trade from mid-1901, argued that with "renewed vigour and with a wise adaptation to our methods of modern discoveries and ideas, the period of partial depression which at present exists will in time, as heretofore, be succeeded by a return of ... prosperity."^ Indeed, Beardshaw's firm from the early 1900's expanded the scale of their operations, boosted by increasing demand for special steels. For example, the company's annual report in November 1902 referred to a "fair years trading" but this had only been achieved by "considerably increasing the tonnage of material manufactured and sold showing that competition is exceedingly keen.

The question of the intensification of production, in response to the changing competitive environment, thus became an issue of major concern to Sheffield producers from the 1880's. Pollard refers to the fact that mechanisation was much more rapidly introduced into the cutlery and tool trades in

Germany and the USA, "But even in Sheffield, where progress was slower, the machine had become indispensable by the 1880's."-^ In cutlery, producers became acutely aware of comparatively lower productivity levels, thus J.W. Dixon referred to the competitive advantages of the Germans in terms of lower wages, longer hours worked, and higher labour productivity compared to their British counterparts.^o However, labour resistance to mechanisation was a fundamental problem, emphasised by the speech of Lord James of Hereford to the Chamber of Commerce in 1902. The position of labour was now claimed to be untenable, and to the general approval of the Chamber he concluded that "if we don't use the best machines you can be sure others will." Indeed, the question of a more rapid adoption of mechanisation was now not simply a trade related issue but had become a question of "national" concern which although not requiring government intervention nevertheless invoked the need for mechanisms of effective conciliation between employer and employees.^ AS the Webb's argued in 1902,

public opinion has become uneasy about the capacity of English manufacturers to hold their own against foreign competition and ... resents ... any attempt to restrict output or obstruct machinery ... And thus we have a growing public opinion in favour of some authoritative tribunal of conciliation or arbitration.

Attempts to develop arbitration structures in Sheffield's trades from the 1860's had largely proven unsuccessful, due largely to employer resistance. For example, the town council, in 1893, proposed the development of "a chamber of arbitration" encompassing the Chamber of Commerce, Cutlers Company and the

Sheffield Federated Trades Council, but "although arbitrators were appointed in 1894 and 1895 no appointments were made in 1896 and "The scheme was still born."^ Indeed, the employers were split on the issue. Steel manufacturers such as W.H. Brittain argued that it would provide the basis for "a much wider and more extended scale before which all trade disputes might be brought and settled." However, Alderman William Smith countered that a chamber of arbitration would not succeed, given the peculiar nature of Sheffield's industrial system, compared to "commercial" centres such as London and Liverpool. The structure of Sheffield's economic base depended on manufacturing not commerce and thus they "did not particularly want to consult their trade rivals ... businessmen were able quietly ... to settle any differences they might have."10

This clearly brought to the fore the relationship between capitalists and labour within the business organisation. Although mechanisation might provide increased production the question of wages in relation to relative unit costs became of major concern to Sheffield businessmen faced with competitive pressures and falling profit margins.H Thus W.F. Beardshaw responded to an article in the Times, advocating that US businessmen would never allow the introduction of "the British ca-canny or restricted production system", by warning the Sheffield unions that they could only maintain their competitive position by enhancing the productive powers of industry. This required that "the British working man would

have to work hard for the days work. The wage may become more, but the man would have to do more in the time in which he was working.

In particular, the question of wage control and the bargaining position between capital and labour was crucial to businessmen faced by periodic recessions and changing competitive circumstances. In other words, the changing external environment, in relation to the firm's resource base, produced an inducement effect which focussed managerial attention on the need to effectively restrain wage demands in the downturn of the trade cycle. For example, the evidence for money and real earnings in the Sheffield trades supports the notion of increased wages in the prosperous years of the early 1870's, falling after 1873, reviving with the upturn of trade in 1880-1883, falling again from 1883-7, reviving between 1887-95, and falling in the severe depression up to 1895 (Appendix C, Table 1). Pollard claims that "boom years" were usually reflected by substantial increases in earnings as trade unions became more active, forcing on employers new price lists or a shorter working week. However, in periods of recession union power particularly in the strategically important skilled unions was blunted. Thus, in the severe recession of 1885, J.W. Dixon could claim that wages for the majority of skilled workers had been substantially reduced, and Stuart Uttley noted in 1889 that wages for both inworkers and outworkers had fallen considerably during the years of depression.^{1/4}

It would seem, therefore, that Sheffield capitalists could resist wage pressures on costs and profits during the downturn of the trade cycle. As Belk claimed, if there was "a shrinkage in business returns" and no corresponding fall in the return to labour the largest part of the decline falls on capital. These arguments were put in more technical terms by the Sheffield Chamber in 1894 in relation to the recession of 1893 and the bitter dispute in the coal industry of that year. Responding to the miner's argument that "wages should regulate prices" they claimed that "your Council feel bound to put on record their belief that this contention embodies an economical heresy ... a tendency to ignore the law of supply and demand, which must regulate trade in all its branches. The essence of the argument was that prices should regulate wages and thus in turn profits. This of course was based on Ricardian principles where profits were directly dependant on real wages, wages being "a function of the labour time required to produce wage goods

The above arguments in relation to wages posed two general issues in relation to the firm's resource development. Firstly, coal as a crucial raw material input to the manufacturing process should be kept as low as possible to compete with the cheaper raw material inputs of foreign producers. For example, Alderman Batty Langley, the Liberal M.P. for Sheffield Attercliffe, informed the Chamber in 1901 that the major cause of the recession was the enormous increase in the cost of

manufacturing coal in the last two to three years-^ and the Chamber concluded that the high price of fuel placed Sheffield at a considerable cost disadvantage compared to the USA.¹⁹ Indeed, the question of the high cost of coal to Sheffield steel producers could provoke bitter confrontation with the coal owners. For example, Sir Fredrick Thorpe Mappin, managing director of Thomas Turton & Sons, attacked the coal owners in 1893 complaining of the high price of coal although the market was "glutted" and the miners had only resumed work a short time.²⁰

The response of Sheffield manufacturers to the question of high coal prices was developments in coal saving techniques and new forms of fuel energy such as gas and electricity with the introduction of the electric arc furnace immediately prior to 1914.²¹ For example, the firm of Edgar Allen's was from the 1890's at the forefront of developing special steels in Sheffield. In 1892, they licensed from Tropenus of France a patent for smelting steel which from 1899 they attempted to license to a number of British and US producers. The advantages of this process over open hearth production were to be gained in higher quality output, less "wasters", easier carrying facilities in the production process and the use of scrap metal. However, the main advantage was a lower blast requirement which would substantially reduce fuel costs.⁹⁹ For large Sheffield producers, particularly those firms producing basic steel and armaments, the strategy was to integrate

backward into mining operations.²³ Thus imbalances in the firm's physical resources, in terms of coal inputs, focussed managerial attention on the need to develop strategies to overcome these constraints.

Secondly, the issue of wages in the coal sector and the relation between prices and wage regulation was taken up by the Sheffield Chamber as a principle to be applied to all sectors of industry. This in itself carried political overtones as portrayed by Stuart Wortley, the Conservative M.P. for Sheffield Hallam, who claimed that

"He represented ... labour ... and if this doctrine that wages were to regulate prices was to be applied he did not see why it should not be applied to the man who earned his wages in other industries ... cutlery, steel, engineering.

The basics of his argument was that the use of wages as a regulating agent would lead to reductions in the real wages of the working class by forcing up commodity prices. Furthermore, this was an appeal for the development of an effective framework of wage negotiation in the Sheffield trades. That businessmen could constrain wages during the downturn of the trade cycle would seem to suggest that wages were responsive to price changes, however the business strategy relating to wage control was far from straight forward.

Indeed, wage negotiation could be a highly complex affair given the diversity of the Sheffield trades and a structure composed of numerous competing private firms. Thus collaboration amongst producers was a highly tentative business

and this was particularly true of the cutlery and tool trades. An illustration of the complex structure of Sheffield's light trades was provided by the representatives of the Sheffield Trades Council, a body representing 10,000 skilled workers, to the 1886 Commission. The Council represented "the skilled trades ... the old staple trades of Sheffield", but they could give no exact numbers as "the trade is so cut up and so diversified ... that it would be impossible to say how many really skilled workers there are."⁶

The process of labour control was further complicated by the highly complex system of outwork and sub-contracting which characterised Sheffield's light trades.⁶ Even in the 1900's larger Sheffield firms still employed numerous outworkers "and others were on a semi-public system, having first call on the workmen's labour but permitting the men to seek orders from outside firms in slack times." The use of "team-work, whereby a team master employed on his own machines teams of youths or semi-trained workers each producing a narrow range of work, usually at piece rates, was still a growing practice by Sheffield firms up to 1914."⁷⁷ Furthermore, the sub-occupancy of tenement factories by small masters was a common characteristic of the industry and the 1907 Census of Production noted the considerable contribution of this form of production to the cutlery and tool trades⁷ (Appendix C, Table 2). In fact, even more progressive firms, in the specialist steel and tool sector, continued to utilise outworkers as exemplified by the

firm of Spear & Jackson who, in 1907, reported that they were to incorporate their "numerous¹ outworkers and contractors "to cover all risks" under the workmens compensation insurance.[^]

This of course suggests the uneven development of Sheffield's light trades and although there was a rapid introduction of machinery in a number of trades, notably files, after 1900 outwork based on the utilisation of a skilled labour resource base was still prominent amongst Sheffield firms. Such a fragmented work system was clearly reflected in the loss of control over the work process and in an anachronistic and complex wage bargaining structure. For example, a delegation from the spring knife trades visiting Germany in 1914 remarked on the more advanced introduction of machinery; the less common practice of outwork; the greater precision in production techniques, particularly in the design and preparation of blanks; superior technical training; less restrictive trade union practices; longer hours of work and lower wages, allowing the Germans a strong competitive advantage.^{^0} However, the complex nature of these trades which had been long established were deeply entrenched in the economic and social relations between capital and labour. Indeed, far from bargaining on wages and work conditions being conducive to mechanisms of arbitration and conciliation, the competitive nature of the business system and the diversified nature of Sheffield's trade unions could throw the whole process into disarray.

This structure could be a drawback to the Sheffield trade

unions when attempting to maintain piece rates. For example, in February 1883 the File Forgers Union accepted the maintenance of a 10% discount on the standard piece rate, which had been in existence since May 1882, on the grounds that they could not get the various branches of the union "to make a stand for the full statement price." An earlier union meeting in March 1880 had noted with "dismay" the difficulty of getting its members "all to work at the one price."³¹ This depicted the multifarious and diversified nature of trade union organisation in Sheffield's lighter trades, where combination was based on craft unions which attempted to maintain their rules of demarcation and power over the apprenticeship system. For example, in 1861 there were 60 different Sheffield unions and in the grinding trade alone there were 10 different union groupings demarcated by product.³² Even in 1910 some 4,667 workers were divided between 31 different societies in the lighter trades making the unions weak both in terms of financial resources and industrial muscle. Furthermore, union organisation reflected the uneven pattern of development between mechanisation and hand production. An example of this was the various unions in the file trades; by 1893 there were two separate organisations for file cutters and file forgers, one for machine labour the other for hand labour.³³

Certainly, between 1890 and 1914 there were attempts at amalgamation which had partial success at least in the silver and Britannia metal trades before 1914, however large scale

amalgamation waited for the war years.^ Turning to the heavy trades, union organisation was slow to develop and employers were relatively untroubled by unions before the 1890's.^ However, as Smith argues, the rapid development of the heavy steel industry in the 1860's and 1870's weakened the influence of traditional craft unions to resist mechanisation. In the "intermediate sector of Sheffield industry which combined heavy steel work with the production of tools", the development of heavy steel production altered the power structure, allowing "employers ... to adopt a more aggressive approach to the craft unions.

But how did employers view the relationship with labour in this period? In terms of wage bargaining, manufacturers associations, when formed, tended to be rather temporary affairs providing little common ground or agreement. J.W. Dixon even claimed that "we have not combined ... we each paddle our own canoe, and we fix the prices as we like."^ However, even when there was combination, as in the case of the File Manufacturers Association, across the board wage agreements could be difficult to enforce. The file manufacturers in the dispute of 1883 were unwilling to concede the restoration of the "full price list", however the Association was in total disarray because some manufacturers were making local works agreements with the men, allowing the full standard rate to be paid. Nevertheless, negotiation and agreement could be reached and in the depressed economic

climate of 1883, 1886 and 1893 the file unions and employers negotiated a 10% discount on the full list price for piece rates, whilst they were restored in the more prosperous years of 1889 and 1896.⁹ As Belk put it in 1886, "these matters regulate themselves ... the depression in trade has really brought about its own cure in that respect.

As one would suspect, given the complexity of the industry's structure, wage reductions during times of depression tended to vary from trade to trade in Sheffield, and as Belk argued, "in some trades the workers have accepted wage reductions, but in others there has been no material decrease. More importantly, wage differentials could exist between firms competing in the same product areas, and wage reductions could be used as a competitive weapon to undercut prices. Thus J.C. Wing, the Managing Director of Wostenholme's, complained bitterly in 1895 of the large price discount on razors being offered by their Sheffield competitors W. & S. Butcher. The reason this company was able to undercut Wostenholme's, argued Wing, was that they had secured an independent reduction of wages from their men and now they are "apparently sacrificing the best part of their profits. A structure of independent wage bargaining thus characterised Sheffield's light trades. This required that businessmen had information relating to the wage strategy of competing firms, and were keenly aware of the need to monitor wage changes.

Indeed, the independent action of firms could allow

unions to force through wage increases to the detriment of the rest of the trade. The organisation of manufacturers to regulate wages was usually induced as a response to union agitation for increased wages. Thus the directors of Wostenholme's reported in June 1890, concerning the action of the Spring Knife Union, that

the master cutlers and men are out on strike. We query a combination of masters. The question of a combination of masters was discussed because it appears that the Spring Knife Trade Unions are operating. The matter may be discussed hereafter. ^

However, rivalry between competing firms militated against effective cooperation on wage structuring. For example J.C. Wing, referred to the attempts by W. & S. Butcher "to manufacture a razor something like your patent safety razor and they are trying to persuade our men away with promises of abundant work and higher wages.

The complex nature of wage bargaining in the light trades was typified by the experience of the large cutlery firm of Needham, Veale & Tyzack. In March 1889, the Spring Knife Cutlers Union demanded that a 7% discount off list prices be restored to them on the basis that all other firms in Sheffield "are doing the same." In reply, the company proposed to set the discount at 2% which they argued put severe pressures on production costs. Thus by December 1889 the company notified the trade of a 5% advance in cutlery prices "owing to repeated wage advances and increases in material costs. This illustrates that wage increases could be passed onto the

consumer in higher prices which was clearly a viable strategy during periods of prosperity such as 1889. However, in the depressed climate of 1893, and faced with intense competition, such an option was clearly not open to the firm. Announcing a 5% reduction in wage rates the management of Needham's claimed that "We regret that the great falling off of business and the keen competition causes us to take this step."^

This reduction was accepted by the Pen and Pocket Blade Grinders, however it was firmly resisted by the other union workers employed by the company. For example, the Table Blade Grinders Union objected on the grounds that wages were already the lowest paid by Sheffield firms "and ... trough rates are the highest in the town," and the Spring Knife Cutlers complained that Needham's was the only firm demanding the 5% reduction; firms such as Kenwoods, Turners, and Wingfield still operating a 10% advance on wage rates and demanding lower rents for wheels and sides.^ This example illustrates the question of who should control wage rates in the downturn of the trade cycle and posed clear problems for management who had to negotiate with diverse union groupings in a business environment which operated against collective action by employers.

The solution for the management of Needham's, faced with the problem of union resistance and a slack market for their products, was to renegotiate the company's terms of employment, instituting a shorter working week and reducing production

time. For example, in May 1893 the company reverted to a three day week, workers paying half rent, and the daily operating hours of the companies engines were reduced. By April 1894 the company had forced the various unions to accept new terms of re-engagement which stated that "in future we be permitted to run short-time by giving ... a weeks notice.

Operating at reduced capacity seems to have been a common strategy employed by Sheffield firms in the face of slack demand. This related to the type of labour utilised by the firm, particularly the reliance on a skilled workforce. As Belk claimed in 1886, the wages in trades using large numbers of unskilled workers had shown substantial reductions due to the "want of employment." Elaborating on this point Samuel Osborne claimed that overall wages had been modified but given the limits on the availability of men in the skilled trades the piece rate had not been reduced. Thus, skilled workers could find work "at normal conditions of wages but it was "a question whether they get three, four or five days a week. However, as Osborne pointed out, workers paid on day rates, "to a certain extent the work of unskilled labour" had suffered considerable reductions in wages. Therefore, underemployment, defined as a reduction in working hours, was seen as a key problem of the Sheffield trades as it had devalued the total wage for piece workers although the standard piece rate remained the same.^

In turn this related to business calculations concerning the profitable operation of the firm. As Belk put it, the fixed

capital costs of operations remained constant "whatever the state of trade." However, when manufacturers suffered from competition and "diminished returns" the burden of fixed charges seriously affected the profitability of the firm. Thus, given these cost constraints and the fact that the prime motive of the firm is survival, it was often to the advantage of the firm, as Belk argued, "to work at or under cost than to close the factory, for, apart from the rapid deterioration of unused machinery, it is most difficult to get together again a staff of employees once dispersed."⁵⁰ Similarly in 1908 A.J. Hobson argued that although the employer had no obligation to outworkers, it was to their advantage to provide work for inworkers and they would stock goods in times of depression, and accept orders at "a price that does not in many cases cover his standing charges - simply for the purpose of keeping his men together."⁵¹

Clearly this represented a more flexible system for employers in the downturn of the trade cycle and indeed the employment of outworkers was central to this structure. The management of Needham's could claim in 1893 that as regards outworkers they had "no control over the hiring of these men, but there shall be no undue preference given to them in the way of work."⁵² However, the light trades operated under a dual system of employment, and Hobson claimed that nearly all firms in the cutlery trade employ both inworkers and outworkers and "if there were any exceptions it would be that there were a few

firms who employ only outworkers rather than the other way."-^ Hobson was giving evidence to the 1908 Truck Committee, whose terms of reference was to investigate the use of deductions for rent and power by Sheffield firms and the wage structure of the industry. Outworkers were not subjected to deductions but received lower average wages due to the fact that they payed the capital costs of accommodation and tools. As Hobson put it, outworkers were "employed at will'l being found work at the employer's convenience. Thus, outworkers were generally less well paid than inworkers though "there are some special operations where no one firm can find the men enough of that particular class of work, and there the outworkers are as well off as the inworkers, for the reason that they are specialists.

Indeed, Hobson argued that it was more profitable to employ outworkers than inworkers and referred to the fact that only two companies, Harrison Bros. & Howson, and Joseph Rodgers had built new factories in Sheffield since 1902. In the case of the former, the factory was designed on modern principles incorporating electrical driving and the most modern machinery but had operated at a loss. The management of the firm informed Hobson that they would have been better off employing outworkers and "The only inducement to build it was the convenience of having the men on the spot."^

In terms of work discipline, Hobson observed that inworkers were prone to irregular attendance and very little

discipline was applied to these workers: "a pieceworker does as he likes, and he often keeps Mondays, and comes at very irregular hours." The response of firms to this problem was to organise operating procedures to accommodate the inconsistency of piece workers, thus the firm adopted no time keeping procedures, operating the engines for certain hours a day affording a wide margin for work.^ Related to the process of work routine was the question of the form of wage system adopted, whether fixed hourly rates should be introduced or piece rate systems maintained. In particular, union agitation for a standard rate of pay was growing in the early years of the twentieth century.^7 Thus Alfred Fretwell, the Secretary of the Sheffield Operative Spring Knife Cutlers Society, informed the management of Wostenholmels, that

It has long been felt necessary, both by employers and workmen in the cutlery trade, that there should be established one uniform price through the trade. The Spring Knife Cutlers (Pocket Knife Branch) ... now ask for the co-operation of their employers. °

The Union thus demanded the recognition of a uniform wage structure throughout the trade which covered in detail the various articles produced by the firm. Thus the Spring Knife Cutlers, advocating an advance in piece rates, presented Wostenholme¹s with a detailed item by item list of pay rates which effectively demarcated products to specific wage rates. According to the Union, this would "have the effect of putting the cutlery trade on a workable basis and lead to a fair working arrangement between masters and men."^

Similar arguments were put forward by other unions. Thus, Tom Newton of the Spring Knife Grinders and Finishers Union argued that uniformity in pricing would bring these workers to parity with other skilled trades, and with improved trade conditions in 1902, "better terms ... is ... what we are fully entitled to ... improved conditions are being spread throughout the trade ... the deductions from their earnings, the increased rents etc I think is quite sufficient grounds ... to ask for increased prices."⁶⁰ Uniformity in piece rates, however, was restricted given the staggering range of commodities itemised in the price list. Thus wage bargaining was complicated by the wide commodity resource base of the firm. For example, the agreed price list negotiated between Wostenholme's and the Blade Forgers listed piece rates for an array of different sized articles, ranging from 3½ inches and under to 6 inches, and prices for forging ranging from 5s to 6s per dozen, with "extras" 1s on the above. Furthermore, the price lists demarcated products by criterion of quality, thus prices for "common pocket knives", forged from common steel, were lower than higher quality steel implements. Rates for outwork was further demarcated, being paid an extra 1s in the pound for "tool money."⁶¹

How did this wage structure affect the business strategy of the firm? Attempts to introduce new product lines met with resistance from organised labour due to the very fact that this required a new price agreement with the unions. An example is

provided by Wostenholme who, in 1902, attempted to introduce to their product range lower quality penknives. The managerial argument was that this required a lower piece rate than for higher quality products, given the lower selling price of this commodity. However, the union's response was immediate, and Fretwell pointed out that "The present advance was to be all round and no mention of common work was named."⁴⁰ It was thus to the advantage of workers to resist the introduction of cheap low quality products which would reduce piece rates.

The latter point relates to the human and physical properties of the firm, which placed a premium on quality and skill. As More claims, "technology is partly a product of skill ... the prior existence of skilled workers determine the price of skill; technology adapts itself to the skill on offer." However, this ignores the strategic implications of skill within the production process. The labour resources of the firm include both unskilled and skilled workers and the plant and equipment of the firm need to be operated by labour. Thus, in terms of business strategy, "the resources of the firm must include workers with skills and ... temperaments which are appropriate to the utilisation of that plant and equipment."⁴¹ Therefore, skill is a resource owned by the firm and the issue of the control of this input was crucial to firms developing product lines based on quality.⁴² The utilisation of a workforce possessing a skilled knowledge of the production process was a major factor in the strategy of the firm. As late

as 1913, the competitive power of Sheffield's industries depended on

The reputation of ... articles, particularly Sheffield steel and the product of machine tool companies and other engineering works, (which) has extended to all parts of the world and is largely due to the fact that the present product represents accumulated experience extending over years and even generations of application.⁶⁶

In turn, quality control required effective supervision of the work process. Writing in 1929, Chapman referred to the problems of piece rate systems in maintaining a uniform standard of quality in production:

The defect of the time rate is that the workman is not induced to do his best, and of the simple piece rate that he is induced to rush, perhaps to the detriment of his health, and perhaps to the deterioration of his work.⁶⁷

The slack control of work routine has been referred to and this rebounded on the work process itself. For example J.C. Wing noted in 1895 that poor workmanship on a new series of knives sent by Wostenholme's to the USA had "injured our reputation"⁶⁸ and similar complaints were made by other Sheffield manufacturers.⁶⁹ Clearly then manufacturers had to reconcile the piece rate system with the desire for quality in production.

However, the problems for management went deeper than this. The growth of the "systematic management movement" in the USA in the 1880's and 1890's gave expression to the principles of Taylorism and according to one commentator,

Taylorism involves systematic analysis of the labour process and the division of labour, followed by their decomposition in accordance with several principles. The systematic analysis of work ... was in order to develop a science of work, and this ... analysis forms the basis for

the calculation of production costs, the establishment of standard times for every task and the associated payment system.

This has obvious implications for analysing Sheffield's light trades. Firstly, a fundamental principle of Taylorism involved "maximum fragmentation" of the work process limiting individual jobs to single tasks.^ That Sheffield's light trades were based on a division of labour is not in doubt. For example B. Fletcher, a cutlery manufacturer, referring to outwork in the file and cutlery trades, argued "that each workman was a miniature manufacturer" and the management of the firm that employed him "had nothing to do with him until he returned the work to the factory."^2

This extensive sub-division of labour was referred to by a workers' deputation from the Spring Knife and Butchers Blade Amalgamated Union to Germany in 1914. However, they noted that the Germans operated "a greater sub-division of labour, and some of the work done by cutlers here is done by grinders in Solingen, such as the grinding and polishing of springs, and all bright parts of the knife. Thus the division of labour had progressed further in the German trades which aided the application of mechanical techniques to the manufacturing process. The reasons behind this development in Germany was emphasised by Hobson who claimed that the German system was similar to that operated in Sheffield, however the fundamental difference lay in the emergence of specialist firms supplying component parts for the whole trade, "in enormous quantities",

which were then assembled in factories. This, according to Hobson, facilitated the rapid introduction of machinery."⁷ However the system of cutlery assembly was similar to Sheffield, piece rates forming the basis of the German system, and "earnings generally depend on the quickness, skill and dexterity of the worker."^{1,7} α

This brings us to a second idea associated with Taylorism, namely the relationship between wages and effort. Littler argues that it is possible for a number of different payment systems to operate in the same factory "depending on circumstances."[^] Clearly, this was the case in Sheffield where it has already been argued that the dual system of outworkers and inworkers required management to mediate between two distinct sets of workers. The basis of the wage bargaining point was the piece rate which thus set the informal standard of effort. As Pollard points out, "payment by the piece, with rates laid down in a price list, remained predominant, though a growing number of team workers and some inworkers were paid a datal wage."[^] However, according to Littler, the question of payment systems does not simply involve the debate over whether piece rates or time wages are introduced, since primarily they both include a wage rate bargain and an effort bargain. Indeed, the key issue revolves around the determination of effort, how does the worker perceive his contribution to the work process? Littler identifies three broad criterion in relation to this question: custom and practice; formal standards; a conflictual

tendency between the two.^ Of course, the Sheffield system did not fit the Taylor scheme where standards of effort were unilaterally determined, nevertheless, the development of standard price lists bilaterally negotiated between management and workers set the formal criterion for effort in the work process.

However, the relationship between wages and effort was blurred in the Sheffield trades. The lack of discipline in the system militated against managerial attempts to intensify the work process and to develop more formal payment systems related to an effort standard. Essentially, workers and capitalists viewed the work system as conflicting, that is there was a conflict between long standing customs and practice and the introduction of more formal standards in the production process.^ Indeed, management saw the long standing tradition of piece rates and related deductions for power and rent^{on} as conducive to the resource base of the firm. Thus Hobson argued that deductions persisted because of the "handicraft" nature of the Sheffield trades and although mechanisation had progressed in various sections of the industry "the question of the cutlery trade is largely one of the slow transference of a handicraft trade on to machinery.

He further referred to workers' demands for a basic net wage, removing deductions and subjecting the worker to regular factory discipline. However, attempts to introduce this system had been unsuccessful and

We have several times considered at my own place trying to bring our men into the engineering discipline. For two years the pocket knife cutlers working on the navy knife, a large, steady order, agreed to charge 54 hours a week ... At the end of the two years the men complained ... and instead of fixed wages, plus a bonus, they pressed me to revert to the piece work system as before. ^

Similar problems were encountered by Wostenholmels who in a dispute with the Spring Knife Cutlers in 1901 refused an advancement on piece rates for certain knives, offering instead a bonus scheme for extra work. However, the company complained that workers were not meeting the bonus target and frequently they were prone "to losing time." ^ Therefore, the link between wage rates and effort in Sheffield's lighter trades before 1914 was clearly a tenuous one.

The question of meeting competition was now at the forefront of business debate, and Hobson argued that "the salvation of the trade is dependent on ... machinery" and this would naturally tend towards a net wage payment system and the imposition of deductions would "die a natural death. However, this was a slow process as the reliance on quality worked against the rapid introduction of machinery. Indeed, the use of skilled labour to produce tailor-made quality items had obvious advantages in a system composed of numerous small firms.^ However, the "more economical" methods of German firms in producing low priced medium quality products, utilising superior machinery, was by the 1900'S a stark reality. For Hobson, this was attributable to "The extraordinary conservatism both of masters and men in

Sheffield." Although admitting that the German worker did not produce the quality of his Sheffield counterpart, nevertheless, they had cheaper labour in the finishing process and the reliance on lower quality was more conducive to mechanisation and longer production runs. Thus the physical commodity resource of Sheffield firms constrained the rapid introduction of machinery as "It is easier to work up from common goods than to work down from the best Sheffield goods.

The question of labour relations in the firm, however, went beyond the issue of payment systems into debates concerning the ability of organized labour to control the supply of skilled workers and the hours and conditions of work. As Pollard points out, mechanisation reduced the supply of labour to the light Sheffield trades and thus the question of limiting the number of apprentices "ceased to be a major issue. Nevertheless, as apprenticeship declined the question of a quality workforce, and the need for technical training, became a major concern of Sheffield businessmen. In other words, modern manufacturing techniques required a shift in the resource base towards more technically trained manpower. This was particularly true in the engineering trades as witnessed by a debate in the Chamber in 1906, where 5 large Sheffield producers cooperated in the naming of apprentices to receive formal technical training.^ That this was a response to educational trends, especially in Germany, was emphasised by the steel manufacturer, Joseph Jonas, who argued that to

successfully compete they must supply "complete and efficient instruction" in the technical processes of manufacture.^

On a more general level, the failure of businessmen to develop an effective response to labour issues were to rebound on them in the years leading up to 1914. This was particularly the case in the heavy trades, where in 1913 there was considerable agitation over a variety of industrial issues, including wage and demarcation disputes, which reflected the growing influence of semi and unskilled labour in these trades.^ On the political front, Middlemass argues that employers were keenly aware of political developments in relation to the labour issue and their "anti-union propaganda conveyed the message that in future they expected governments to stand clear of industrial politics. Certainly, Sheffield businessmen were antagonistic to government efforts to control industrial relations which interfered with the rights of individual employers or combined action by manufacturing associations, attacking the 1906 Trades Disputes Act and the 1911 National Insurance Act as infringements of individual rights.⁸⁹3^

Ironically, it was in the heavy trades that capitalist-labour relations were to culminate in open conflict and it was this crisis which forged a united front by Sheffield businessmen. The cumulative nature of union action, outside the realm of the individual firm, led Arthur Balfour during a strike by steel converters in 1913 to claim that the employers

had lacked "cohesion" and an effective organised policy unlike "the highly organised system of the workers." This led the Chamber to endorse closer cooperation by employers' organisations in combatting strike action.⁹³ The light trades, however, which still clung steadfast to the employment of skilled operatives, remained relatively aloof from these problems.

This chapter has argued that in the light trades, prior to 1914, mechanisation was slow to develop especially when compared to the techniques of German manufacture. Sheffield firms were constrained by the peculiar structure of the industry, and by an archaic relationship between labour and capital. This delayed the rapid introduction of new techniques, and militated against a more progressive division of labour, and the introduction of payments systems that reflected the link between effort and wages. This is not to deny changes in the trade, particularly in the years leading up to 1914, but it in part reflects the uneven pattern of development and the gradual transformation of an handicraft trade to mechanisation. The emphasis on quality in the production process was a major characteristic of the light trades, and indeed was a common feature of steel production, especially in special steels. Thus the successful marketing of this product would be a major factor in assessing business response, and this forms the basis of the next chapter.

Notes and References

1. The Engineer, vol.49 (1), 1880, p.12.
2. P.P., 1886 (c4714), 21, Second Report of the Royal Commission on the Depression of Trade and Industry, p.83.
3. SCL, Records of Sheffield Chamber of Commerce and Manufacturers (hereafter SCCM), LD1986(5), Minute Book, , 25 Jan. 1902. W.F. Beardshaw was the Managing Director of the steel and tool firm of J. Beardshaw & Sons from its incorporation in 1893. He was a J.P., President of the Chamber (c1901-3), a member of the Institute of Civil Engineers, and the Iron and Steel Institute. Baltic Steel Works Magazine, vol.1, no.1 (1919), p.1.
4. SCL, Records of Beardshaw's, MD7081(5), Minute Book, 21 Nov. 1902.
5. S. Pollard, A History of Labour in Sheffield (1959), pp.126-7. As Belk noted P.P., 1886 (c4714), 21^ p.83, "machinery is to some extent superseding hand labour ... there should be a considerable increase in the output."
6. P.P., 1886 (c4714), 21, p.21.
7. Sheffield Independent, 1 Feb. 1902. The issue of labour resistance had been raised during the engineers strike of 1897, S.E. Howell, the President of the Chamber, claiming that Britain's competitive position depended on "freedom for manufacturers ... to adopt all new machinery and labour saving appliances without let or hindrance." SCCM, LD1986(4), 27 Jan. 1898. Such arguments were related to the ideal of peaceful coexistence which could find some strange political allies, as in the support of joint employer action and condemnation of union agitation by Frank Maddison (ILP) and Batty Langley (Liberal), Ibid., 26 Jan. 1900; 15 Dec. 1902.
8. S. & B. Webb, Industrial Democracy, (1902), p.25.
9. D. Smith, Conflict and Compromise (1982), pp.164-9, 245.
10. Sheffield Daily Telegraph, 31 Jan. 1893.
11. As Belk argued, Sheffield had "no monopoly of either industry or of inventive talent, free trade alone cannot possibly be made to do the duty of industry ... in other parts of the world ... the working classes are more frugal and perhaps more thrifty. P.P., 1886 (c4714), 21, p.79.
12. Independent, 1 Feb. 1902; "The Crisis in British Industry", The Times,, 27 Dec. 1901.
13. Pollard, Labour, p.130.
14. P.P., 1886 (c4714), 21, p.23; P.P., 1889 (c165), 13, Third Report from the Select Committee on the Sweating System, p.589. Uttley was Secretary of the Sheffield Trades Council, a workers' association.
15. P.P., 1886 (c4714), 21, p.79.
16. SCQ1, LD1986(4), 30 Jan. 1894.
17. M. Blaug, Economic History and the History of Economics (1969), p.92.
18. Telegraph, 31 Jan. 1901. Langley was proprietor of the Sheaf Saw Mill, elected to Parliament as a Liberal in 1894, he was Mayor of Sheffield in 1892-3. See J.H. Stainton, The Making of Sheffield (1924), p.355; South Yorkshire Notes and Queries, vol.1 (1899), p.123.
19. SCCM, LD1986(5), 25 Jan. 1902.
20. Independent, 31 Jan. 1894. Turton's produced steel, engineering and light tools, and railway equipment, RV, 1880, £2,801. For biographical notes on Mappin, see Stainton, Sheffield, pp.345-6; W. Odom, Hallamshire Worthies (1926), pp.91-5.

21. See Chapter 8.
22. SCL, Records of Allen's, Aurora 541(a), Letter Book, Allen's to E.P. Martin (Dowlais), 1 March 1899; A.E. Wells (Director), to the Republic Iron & Steel Co. (Ohio), 25 May 1899. The firm developed specialsteels, particularly manganese, see Illustrated London News, Supplement, 1 May 1909.
23. J.G. Timmins, "Concentration and Integration in the Sheffield Crucible Steel Industry", Bus. Hist., vol.24, no.1 (1982), p.68.
24. Telegraph, 31 Jan. 1894.
25. P.P., 1886, (c4714), 21, p.5.
26. See evd. of Uttley, P.P. (c165), 13, pp.588-94.
27. Pollard, Labour, pp.134, 207.
28. The census noted a dual mode of production, partly carried out by "factory owners with their own staff, and partly by tenement occupiers", who rented power and space from the factory occupiers. These tenants sometimes purchased their own materials or worked on material "given out to them by the principle occupiers of the factories in which they have rooms." P.P., 1907, Census of Production, pp.18-19. In 1893, the Chamber agitated against proposals to amend the Factory Acts to classify tenements as factories. SCCM, LD1986(4), 16 Nov. 1893.
29. SCL, Records of Spear & Jackson, SJC69, Letter Book, S & J to E. Richmond, 3 July 1907.
30. Cited in Pollard, Labour, p.203. Similar remarks were made 5 years later by an employers' delegation. SCL, Records of Needham, Veale & Tyzack, NVT22, Sheffield Cutlery Manufacturers Assoc., Report on Mission to Solingen, July 1919.
31. SCL, Minute Book of the File Forgers Union (FFU), MD402, 19 Feb. 1902.
32. Smith, Conflict, pp.39, 44-5.
33. Pollard, Labour, pp.216-8.
34. Ibid., pp.216-24; Smith, Conflict, pp.245-6. A significant development, however, was the politicisation of the Sheffield unions, culminating in the formation of the Sheffield Trades & Labour Council in 1908. See J. Mendelson et al, The Sheffield Trades and Labour Council 1858-1958 (1959), pp.56-7.
35. Smith, Conflict, p.243.
36. Ibid., p.257.
37. Pollard, Labour, p.134.
38. P.P., 1886 (c4714), 21, p.21.
39. FFU, MD402, 19 Feb. 1883; 9 May 1900.
40. P.P., 1886 (c4714), 21, p.79.
41. Ibid., p.75.
42. SCL, Records of Wostenholme's, Wos R3, Letters to America, J.C. Wing to F.B. Gurney (NY), 16 Feb. 1895.
43. Ibid., Wing to J. Curley (NY), 19 Jan. 1895. Curley was the firm's US patentee.
44. Wos R144, Private Draft Minute Book, June 1890.
45. SCL, NVT8, Minute Book, 5 March, 7 Dec. 1889.
46. Ibid., 8, 21 April 1893.
47. Ibid., 5 May 1893.
48. Ibid., 16, 19 May 1893; 23 April 1894.

49. P.P., 1886 (c4714), 21, pp.84, 103, 106.
50. Ibid., p.75.
51. P.P., 1908, Truck Committee (cd4442), p.961. Hobson was giving evidence on behalf of the Cutlery Manufacturers' Assoc., and was a director of Richard Hornsby & Son, William Jessop's, and Chairman of Savoy & Co. Firms often gave wages on "stint", workers provided with work to give "a living wage", which was fixed by individual firms to retain "valuable" inworkers. This preference for inworkers was a growing source of discontent amongst the unions. NVT8, NVT to A. Fretwell, 19 May 1893.
52. NVT8, NVT to Fretwell, 19 May 1893.
53. Truck Committee, p.951.
54. Ibid., p.952
55. Ibid., pp.954-5.
56. Ibid., p.952.
57. Pollard, Labour, pp.209-10.
58. Wos R23/4, Union Correspondence, A. Fretwell to J.A. Paine, 4 April 1901.
59. Ibid.
60. Ibid., T. Newton to Paine, 20 May 1902. See also G.H. Shaw (Pen & Pocket Slade Forgers), to Paine, 25 Aug. 1902.
61. Ibid., Shaw to Paine, 25 Aug. 1902.
62. Ibid., Fretwell to Paine, 23 Aug. 1902.
63. G. More, Skill and the English Working Class (1985), p.176. A number of authorities compare skill levels in the UK~and USA and point to a shortage of skilled labour in the USA in the late nineteenth century which increased wage differentials and stimulated labour saving technology. See, Ibid., pp.171-4; N. Rosenberg, "Anglo-American Wage Differentials in the 1820's", Jnl. of Econ. Hist., vol.27, no.2 (1967), pp.221-9; H.J. Habakkuk, American and British Technology in the Nineteenth Century (1967), p.131.
64. S. Moss, An Economic Theory of Business Strategy (1981), p.17.
65. Marketing strategies in relation to quality output are analysed in Chapters 5 and 6.
- bb. American Machinist, vol.38, 1913, pp.79E-80E.
67. S.J. Chapman, Outlines of Political Economy (1929), p.346. Low quality work may be engendered by alienation within the work process. See D. Roy, "Making Out: A Workers Counter System of Work Situation and Relationships", in T. Bums (ed), Industrial Man (1969), pp.260-1.
68. Wos R3, J.C. Wing to F.B. Gurney, 2 Jan. 1895.
69. See SJC69, S & J to P. Robinson (Sydney), 18 Oct. 1907.
70. C.R. Littler, The Development of the Labour Process in Capitalist Societies (1985), p.51.
71. Ibid., p.51.
72. Telegraph, 31 Jan. 1893.
73. Wos R23/10, Report of Deputation Visiting Solingen, National Amalgamated Union of Labour, Spring Knife and Butchers Blade, May 1914.
74. Truck Committee, p.966. German firms specialised in providing standardised stampings to the trade, and provided various parts of the knife in bulk to the cutler, "made to gauge already for putting together."
75. Wos R23/10, Deputation, May 1914.
76. Littler, Labour Process, pp.59-60.
77. Pollard, Labour, p.209.

78. Littler, *Labour Process*, pp.59-60.

79. As D.Landes. *The Unbound Prometheus* (1969), p.319, points out, management tended to let custom set the level of work performance¹, and this was only gradually broken down in the second half of the nineteenth century, as economic difficulties forced on business the need to cut labour costs by "increasing performance."

80. Such deductions blurred the managerial and workers concept of the average wage. Thus, Fretwell argued that the "the question on the average wages we find is quite misleading ... at £1 13s 10d ... he has to pay for hafting 4s 8d, gas and shop rent 10d, working expenses 1s ... leaving ... £1 7s 4d. Wos R23/4, Fretwell to Paine, 4 April 1901.

81. Truck Committee, p.957.

82. *Ibid.*, p.953.

83. Wos R23/4, 4 April 1901.

84. Truck Committee, p.958.

85. See More, *Skill*, p.174.

86. Truck Committee, p.967.

87. Pollard, p.212. However, some unions continued to resist employers attempts to limit apprenticeship. For example, the Britannia-metal Smiths Union forced the employers to renegotiate the rights of apprenticeship in 1902, allowing piece workers to supervise training. SCL, Records of Cooper Bros, 499/B1/10, Britannia-Metal Smiths Dispute, Terms of Settlement, 21 Aug. 1901.

88. SCCM, LD1986(6), 12 Feb. 1906. In 1886, J.W Dixon could claim that his workers received no technical education, "except what they learn in the factory." P.P., 1886 (c4714), 21, p.21

89. *Ibid.*, LD 1986(5), 11 May 1899. E.W. Evans & N.C. Wiseman, "Education, Training and Economic Performance: British Economists Views 1869-1939", *Jnl. European Econ. Hist.*, vol.13, no.1 (1984), p.142, argues that British businessmen were indifferent to education. However, the Chamber records point to a growing interest in technical education from the 1880's.

90. Pollard, *Labour*, pp.239-40. This was associated with national trends in strike activity, c1911-14. See J.E. Cronin, *Industrial conflict in Modern Britain*, (1979), p.51.

91. K. Middlemass, *Politics in Industrial Society* (1979), p.66.

92. SCCM, 1986(8), 5 Jan., 7 Feb. 1912.

93. *Ibid.*, 3 June 1913.

Products and Markets: The Response of Sheffield Firms 1880-1914

In 1916 F.A. Warlow, the Lord Mayor and managing director of Edgar Allen's, proudly boasted of the superior reputation of Sheffield steel:

Sheffield steel stands at the top for general quality in the markets of the world ... Measured by quantity, Sheffield may well be outclassed, for in many centres of the world's steel industry enormous quantities of the cheaper mild makes are turned out, but for quality the city stands alone.-†

As argued earlier, the firm's resource development was based on the use of skilled labour in the production of high quality products and this was true of cutlery and tool firms as well as firms involved in the specialist steel making trades. The aim of this chapter is to explore the marketing response of firms in an environment of growing competition after 1880 and relate this to the reliance of producers on quality production as a formula for business success. In other words the resource structure of the firm shaped their marketing response and their competitive strategy. Furthermore, the marketing mechanisms adopted by firms in turn had fundamental implications for business organisation and structural change.

In 1886, J.D. Ellis, the managing director of John Browns, argued that Sheffield could hold its own in "things that are made of steel, especially those in which a good deal of skill is required in proportion to the quantity of material."^o As Samuel Osborne claimed, it was the technical ability to produce a uniformly consistent product which was the

key factor in the maintenance of Sheffield's competitive lead over the USA, and "in the main we have been able to meet the Americans in many of our foreign markets ... I think the manufacturers of today are very much more alive (to the need for quality) than they have ever been.^ As Tweedale argues, referring to the cutlery trades, the reliance of Sheffield on its specialist knowledge in production was a major asset, allowing the industry "to adapt rapidly to changing fashions and demands." Indeed, Sheffield continued to sell to the USA best quality cutlery in the 1890's and 1900's due to its ability to conform to a uniform pattern of quality production.^

Similarly in the production of tools and specialist steels, produced by the crucible process, the name of Sheffield was renowned for quality. Indeed Tweedale's excellent work on the technological links between Sheffield and the USA shows clearly that Sheffield was a major centre of innovation in these steels before 1914, transferring technical knowledge across the Atlantic.-' The introduction of high speed steel revitalised Sheffield's tool steel trade with the USA, although only small quantities were produced; by 1914 the total Sheffield production was only 6-7,000 tons.³ As Pollard points out, the position for the British steel industry "was not uniformly gloomy" and Sheffield continued to supply the US with special steels despite the tariff.'7 In 1907, Sheffield supplied the USA with about half its annual consumption of 4,000 tons of high speed steel and up to 1914 the industry gained a short

terra comparative advantage in the higher quality brands. By 1907, the firm of Samual Osborne & Go. found it was no longer profitable to sell the less special of the special steels.^Q Furthermore, on the eve of the First World War Harry Brearley of Sheffield discovered a process of manufacturing stainless steel which was to have major implications for the cutlery trades.[^]

Thus technical developments in special steels, based on quality, was a major factor in the revival of Sheffield's business fortunes prior to 1914 and this needs to be explored in terms of the business strategy of the firm. Again, however, the uneven development of Sheffield's industrial system is evident and the cutlery trades suffered from intense competition and as argued earlier a decline in markets particularly the US market for lower quality products. Furthermore, an obvious strategy open to business firms faced with growing competition in traditional markets was to switch into less restrictive world markets. In terms of developing new trade areas, W.H. Brittain, the President of the Sheffield Chamber of Commerce, had little doubt that this was vital to the city's economic progress:

In this time of high tariffs, when walls were built up against us in certain markets ... we should do our best to hold our own in these markets and seek fresh outlets in every direction we could possibly extend our commerce.

This clearly indicated that faced with growing competition behind high tariff walls that firms should diversify their areas of influence into new market areas.

But what new markets should Sheffield firms enter? The obvious area of market expansion was Colonial markets and this first found expression in evidence given by various Sheffield businessmen to the 1886 Commission.[^] Indeed, the notion of Colonial expansion was to become a political platform for the Sheffield trades in the debate over tariff reform and as Howard Vincent, the Tory MP for Sheffield Central claimed in 1894, the expansion into Colonial markets was "the most valuable and most likely to be advantageous to the British goods trade - the most likely to remove us from the slough of depression. Thus, it can be argued that Sheffield firms saw their route to survival has being linked to a strategy of diversification into Colonial markets. Saul, for example, claims that in the 1880's the iron and steel industry continued to rely heavily on US demand and in consequence of high tariff barriers continued to suffer from it. However, the reduction of exports to this market was "much modified by the growth of trade with South Africa, India, Australia, China and Japan under the stimulus of capital construction projects of all kinds." Nevertheless, he does claim that the decline in the export of iron and steel after 1883 was more severe and prolonged than in any other export Industry.

The shift into Colonial centres of trade has often been regarded as an example of British businessmen taking the soft option. For example, Hobsbaum has claimed that faced with competitive pressures British businessmen adopted a

conservative response and "'retreated into a satellite world of formal and informal colonies", and Kirby emphasises that "Britain sought the least line of resistance in the imperial markets and the underdeveloped parts of the world, not yet penetrated by foreign competition." ^ Such claims, however, have recently been questioned by Nicholas, who argues that statistical tests support Saul's contention that British export shares to the Empire and Europe were constant c1880-1913, although there was a falling off in exports to the USA.¹⁵

Given this argument, Nicholas claims that since export shares by market were stable this implies that if British businessmen failed in their marketing strategies they failed in all export markets since overall Britain's share of trade in manufactured goods declined from 41.4% in 1880 to 31% in 1913. The damnation of British businessmen abroad is related to two overlapping arguments: selling techniques were inefficient and they adopted the wrong institutional framework for selling commodities. However, as Nicholas points out, "neither proposition has been supported by detailed study of British business practices or institutional arrangements abroad."¹⁶

Given this evidence, the obvious conclusion is that there was nothing particularly soft about entering Colonial markets, indeed firms had to develop effective mechanisms of exchange and resist competition in what was regarded by British businessmen as prime markets. As will be shown in relation to Sheffield, firms had to develop their marketing structures to

meet the particular requirements of Colonial demand. British businessmen might well agree with J.S. Jeans, who in 1885, claimed that "trade follows the flag";^ however, a switch to Colonial markets required a dynamic response by firms faced by competition in traditional and neutral markets.

In terms of the marketing response, Nicholas concludes that the view of "British industrialists employing amateurish marketing techniques and outdated selling institutions is misleading." For standardized products, British firms developed interlocking links with merchant houses which reduced uncertainty, provided credit and created "a common selling market." These intermediaries "overcame the high information costs of transacting, allowing small manufacturers to compete in the international market." Firms developed vertically integrated distribution systems, whereby merchants took on the function of sole agents for the manufacturing firm, and eventually direct representation. Thus, the major innovation in selling abroad after 1870 was the control of the channels of distribution by manufacturers. In its most sophisticated form, British firms developed sales branches overseas giving them greater control over marketing operations and information flows.¹⁰ In this sense, the marketing response of the firm was directly linked to structural changes in business organisation.

But why were these innovations undertaken? Following the lead of Williamson,¹⁰ Nicholas claims that the choice of institutional machinery adopted by the firm depended solely on

the type and frequency of transactions and the cost of investment in durable market structures. Thus the firm pursued a particular kind of economic rational geared towards reducing transaction costs. Without denying the importance of transaction costs in the decision making process, there is surely a need to consider the technological parameters which shape and limit the coordination of markets. In other words, the resource development of the firm, and the type of product it produces may shape and indeed be determined by the marketing strategy adopted. Therefore, the marketing response of the firm cannot be divorced from the development of the firm's physical and human resources.

We have already emphasised that the firm's resource base was based on the manufacture of a quality product which in turn required a skilled labour force. This reflected the competitive position of the firm which came under increasing pressure with the growing introduction of mechanised techniques and bulk steel making from the 1880's. The debate over hand techniques and its association with quality became a major issue between capitalists and labour in this period. For example, the Sheffield Trades Council informed the 1886 Commission that,

We are not here to oppose the introduction of machinery ... we have seen too much and are cognizant with the progress and development of intelligence and skill in the production of labour saving machinery ... but we are of the opinion that it is due to the workmen that there should be protection for them, and if it succeeds let it do so upon its own merits and not upon the strength of the name which the workmen themselves have earned.

The basis of the workers' arguments was that the development of mass produced steel, especially Bessemer steel, was undermining the competitive position of Sheffield as a centre of quality, and "poor quality" was losing valuable markets, particularly in the USA. In fact they claimed that bulk steel producers were manipulating the Sheffield trades, and "at the very foundation of our manufactures there lies a system of imposition which ... will very speedily destroy all confidence in Sheffield steel and render abortive the enterprise of our manufacturers and the skill of our workmen." Referring to the production of Bessemer steel, they complained bitterly that this "has ... brought into the market a cheap class of steel, useful for purposes where a keen cutting edge is not required." However, for high quality cutlery products it was unsuitable though they recognized the price differential in favour of Bessemer steel in relation to crucible steel.^{oo}

Furthermore, they attacked the large steel producers and fabricators for flooding the market with low quality machine produced goods. Referring to the production of table knives, they argued that machine forged blades "are very inferior in shape and finish, and, not receiving the care which is bestowed upon those forged by hand, cannot possibly be as good."[^] Furthermore, firms were selling steel products, manufactured by machines, labelled as high quality cast steel, which was further undermining Sheffield's competitive edge.[^] This also found expression amongst smaller manufacturers. Thus J.T

Deakin, a partner in the cutlery firm of James Deakin & Sons Ltd., claimed that he had been engaged in the Brazillian trade for 25 years as a "small manufacturer" and general merchant and had "not the slightest fear of German competition." However, he complained of the deterioration in the quality of Sheffield cutlery, and referred to the unfair practices of the larger producers: "their great fear was not with regard to the German, but with the unprincipled scoundrels, my own fellow manufacturers and merchants ... he had to suffer as much from the unprincipled doings of Sheffield men as most men there.

The impact of mechanisation, however, was to affect Sheffield's comparative advantage abroad, and this was true of Colonial trade as well as in the USA. A report by the Australian agent of the cutlery firm of I.E. Bingham and Co., in 1897, referred to intense competition by US and German producers in this market and concluded that they had captured 90% of the the Australian scissors trade. The reason behind this state of affairs was the lower prices offered by foreign producers, in particular machine produced German scissors which were ousting the US product from the market due to its higher quality. This price advantage over Sheffield firms was maintained by the fact that the German product was cast in large batches, while the Sheffield commodity was hand forged.^ In conclusion, it was argued that the Germans had a superior advantage not only in terms of price but also in marketing technique:

You can only purchase Sheffield scissors through London

merchants while the Germans go directly to the firms that supply the users, drawing upon them direct at 90 to 120 days, documents on acceptance. There is no doubt that they will knock out the English article, because firstly the price, secondly the easier trade terms and thirdly the Germans are represented and the English are not. /

Competitive pressures in neutral markets, for a number of Sheffield products, was also evident from a report by the Foreign Office on Argentinian trade in 1897:

Germany and Belgium have almost destroyed our trade in iron fencing, wire and iron girders. In cutlery, locks, hinges, tools and other branches of the hardware trade England holds her own as regards quality, but other nations supply inferior articles at lower prices. °

This dismal report on Sheffield's competitive position prompted the Chamber to call for greater efforts to introduce machinery in response to the German and US practices. Reductions in cost were now imperative "if the competition of foreign nations is to be met and overcome." ^ However, the seeming contradiction between high value quality production and low value quantity production still remained. This paradox was emphasised by William Beckett, a partner in the firm of Alfred Beckett & sons, steel and tool producers, ^ in evidence to the 1907 Committee on the Truck Acts. Asked whether the Sheffield system of production was as cost efficient as the German methods, he replied that "We do not want to produce cheaply; we want to produce good quality." For Beckett, the resource base of the firm was the key factor in explaining the type of product produced and sold by the firm. Sheffield could match Germany and the USA in manufacturing high quality goods at comparative costs, but could not compete in low quality items because of

the higher wages and lower productivity of Sheffield workers in producing inferior brands. However, "In high class stuff we cannot be touched, because it will stand the money, and we have the skilled men who can do it who are worth the money."³¹

Such arguments were particularly related to the specialist steel market. The American Machinist claimed in 1905 that "A brisk business is being done in crucible steel, especially with the higher brands."³² Furthermore, in 1912 the journal highlighted the exceptional demand for tool, alloy and high speed steels and despite the keen competition from the USA, "Tool steel makers are full of work ... largely due to the gradual ousting of foreign tools by British producers."³³ The American market, it was noted, "is again taking a fair weight of Sheffield products." The reasons behind these changing fortunes were clear to H.H. Bedford, the President of the Chamber in 1906⁴, who claimed that Sheffield had witnessed a considerable improvement in trade especially in steel and tools. This had induced a number of firms to increase the scale of operations and he referred to the example of the large firm of Jonas & Colver (RV 1901, £1,302), who were about to double the size of their works. The revival of trade was partly due to the fact that "Sheffield manufacturers for some time past had made the excellence of quality their first consideration."³³ Thus as Elbaum and Lazonick argue, British firms retreated from competition "with mass production methods (and) sought refuge in higher quality and more specialised product lines, where

traditional craftsmanship and organisation could still command a competitive edge. ^uJO

This has obvious implications for the selling methods adopted by Sheffield firms and the direction of trade. In other words, the market response of the firm was identified with attempts to sell in a competitive market based on quality not quantity. Thus it was quality not price which was the key factor in explaining the marketing strategy adopted by the firm. This was true of Colonial markets as well as the traditional US market. For example, Christopher Johnson & Co. informed their Australian agent J.W. Bundy in 1886 that "undoubtedly our sale of uniformity, which is well known to all our clients, is the safest and best for us, and most likely to give general satisfaction."^ They further added that,

We consider that we have gone quite far enough in making cheap table cutlery to meet the growing competition and if we go much further our friends will have the impression that we are merging into common makers, which would not only damage our good name, but we should seek to rank as first class cutlers, which position we have always held in the Colonies.

An emphasis on quality selling is also provided by the example of Wostenholme's. This firm mainly sold high quality cutlery in the USA, but from the 1880's pursued a policy of diversifying its market area. A description of the firm's sphere of influence in 1893 claimed that the company carried on an enormous business, exporting to the Continent, Australia, Canada, USA, India, China "and almost all foreign markets. In 1887, following the advice of their resident New York

director T. Ward, the management argued that "we should turn to new markets. We can use more work ... and we cannot keep them (the men) on without new markets." In relation to this, the management had opened negotiations with agents in India and Australia with a view to developing new market contacts.^ To penetrate the Australian market, the Company negotiated terms with the Melbourne importing house of Christies which went into bankruptcy in 1888.^ The problem of this market, was the influx of cheap low quality cutlery which accordingly brought forth discussions on the possibility of introducing cheaper lines. However, the plan was shelved on the grounds that "nothing must be done to diminish the reputation of Wostenholme cutlery." It seems likely that prevailing market conditions determined this decision and the management argued that "the present general high prices are not favourable for an experiment in cheaper goods.

A similar reliance on the medium of quality in the mechanisms of market exchange is evident in firms producing steel and tools. For example, H.M. Howe, the representative of the firm of Spear & Jackson in the Transvaal in 1906, informed the management that the market demand for steel shovels dictated the production of a lower quality article at a cheaper price. However the management responded that this did not meet the prevailing cost-revenue calculations of production and

To supply shovels at this price would leave no margin for profit and we do not profess to be cut-out for supplying cheap quality goods as it is only when a decent article is

required that we lay ourselves out to produce and to sell, and have no desire to follow every cheap line.

Indeed, the company went so far as to argue that the quality of the product was the crucial factor in the customers preference to purchase. Referring to samples of saws sent to the Transval, the management claimed that "we desire to sell" and informed Howe that the improvement in the quality of this product must be emphasised and "fully explained to buyers.

Having defined this broad base for identifying the marketing policy, how did Sheffield firms pursue a strategy of expansion in the face of growing competitive pressures? To explore this question we need to define the product composition of the firm. In other words what were the physical characteristics of Sheffield steel products and how did this effect the marketing strategy of the firm? Moss claims that the physical characteristics of a commodity, ie. compactness, durability and standardisation, favours market intermediation and the producing for stock rather than order.⁴⁵ But did Sheffield firms produce a standardised product which allowed the employment of intermediaries and the development of a technical base designed to produce large production lines for stock?

Moss argues that cognizability is the key to understanding the process of exchange. If a product is not recognizable in the market then it has no basis in the system of exchange. Thus the physical characteristics of the commodity must be specifically recognizable by prospective buyers and "If a

particular type of commodity is cognizable, then every unit produced will conform to known specifications." Therefore, standardisation will render products cognizable; in other words "cognizability is an economic property which follows from the physical property of standardisation."^ it would therefore follow that a strategy of exchange based on selling a standardised product would be geared towards developing a recognizable market profile for the commodity.

In the Sheffield cutlery trade, standardisation was not by product but rather by brand. Sheffield firms marketed by developing established brand names which linked to a strategy of advertising through intermediaries and protected by trade mark legislation. For example, Wostenholmes sold under the brand names of "IXL" cutlery and the "Famous Pipe razors."^ Essentially then standardization was forced on buyers by the recognition of the branded product in the market. As Moss points out, "in some cases the properties of a commodity will be understood because the commodity is branded. In the case of Sheffield firms, the properties of the commodity were embodied in the emphasis on quality production. Thus trade marks identified the product with quality, which in turn focussed managerial attention on the need to maintain high standards in the production process.

This was clearly evident in the response of cutlery firms to advertisement. W.H. Fraser argues that by the 1880's the use of advertising as a competitive weapon "had become essential

for any firm seeking to break into a market ... or, in many cases, to hold on to existing markets. The simple economic rationale of advertisement is to provide market signals to consumers on prevailing prices and the variety of products on offer; to expand the flow of information between producer and consumer.¹ However, the function of advertising is not merely to inform but also to persuade. Thus the advantages of advertisement are contained in providing selective information and emphasising the superiority of the product over potential substitutes. The potential benefits are realised in increased demand at a given price, reducing the elasticity of demand, and allowing the firm not only to increase the volume of sales but also set a higher price.¹ A

This has obvious implications for firms in the higher end of the cutlery market. For example, in 1886, Wostenholme's registered its trade marks with the Cutlery Company with the intention of selling in the Australian market.² To promote the product, and overcome initial sales resistance, the firm published an extended sales catalogue advertising a new range of cutlery products and informed its representatives to circulate it widely to the trade. The selling point to get across was the superior quality of the article,³ and this was viewed as a long-term strategy which, although entailing high short-run costs, would ultimately produce considerable benefits:

The work has been well done and should be a great advantage to the company - if it is not then any further

catalogue may be regarded as useless. This is not a cost to be written off out of the profits of any one year. ^

In the production of tool steel a similar market ploy was adopted. For example, the firm of Jonas & Colver was described as producing a number of different qualities of tool steel "which are sold by them and their agents under particular trade names. However, in a dispute with the US State Department over the marking of steel the company claimed that they did not label the steel to indicate different grades, or the temper and proportion of carbon in the steel, but rather argued that the major market requirement was to identify the functional use of the steel. Referring to their New York importers, Hirman Boker & Go., the management claimed that this firm insisted on specifying the different grades of steel and the various use of cold rolled steel which was largely imported for the manufacture of springs. This was deemed satisfactory to both parties and the management argued that they should not be forced to reveal the composition of the steel either to buyers or the US custom house, as "Our experience has been gained by long years of costly experiments enabling us to ascertain the most suitable quality and temper of steel for special purposes and we consider this experience a trade secret.

In terms of pricing the commodity, this reflected the customer's requirements and as Jonas & Colver argued, the price of steel did not depend on carbon content and different grades and tempers of steel were used for the same purposes. The price was governed by reference to "quality, sizes and finish.

Thus, firms produced to meet the specific requirements of consumers and this in turn dictated the price of the commodity. For example, in a letter to J.B. Caryesfora, the London agent of Spear & Jackson in 1909, the management informed him that producing a quality steel to meet particular requirements was the key to success and

It is a fact that in many lines we do not see our way to accept orders at the prices of our competitors and we have not therefore been able to advise you we could do so. We endeavour to make an article that will sell at above the price of the bottom figure. °

This clearly reflected the emphasis on producing to order and the reliance on quality as the determinant of the pricing of steel.

Meeting the specification of the market was clearly emphasised by the firm of Joseph Beardshaw & Co. The firm from the early 1890's decided "to push the sale" of specialist steel for saws, drills and machine tools under the brand name "Profile Steel", and successfully introduced processes for manufacturing cold metal saws made of high speed steel for metal cutting. The importance of meeting specifications was portrayed by H. Spear, the firm's London agent in 1900. Referring to an account for tool steel with Alfred Herbert & Co. of London, Spear argued that "their recommendation of your steel to the users of their machine tools, is of immense importance." The requirements of the customer dictated that special chrome steel should be of a uniform temper, which the firm had failed to achieve. This was now a major priority in

developing specialist markets, given the increasing technical requirements of customers. As Spear claimed,

It is the all important question in all makes of best tool steel, but it has become of far greater importance in connection with the introduction of automatic machine tools ... the steel maker who succeeds in meeting this requirement will secure a speciality of immense commercial value.

Furthermore, the changing specifications of the market required management to be aware of product design. Thus Spear argued that a considerable part of the London retail market, for saws, had been penetrated by US patterns, and the firm could capture a share if they would be willing to design products on American lines.

The need to meet customer specifications was again clearly demonstrated by P.R. Kuennrik, the managing director of Marsh Bros., who had little doubt that such a policy was crucial to his firm's future market success. In a report on a planned project for constructing a plant for producing cold rolled steel, he argued that firms such as Jonas & Colver had successfully introduced this technique and were expanding their operations. The success of this project lay in the establishment of a direct link with the consumer, because of the "peculiar" nature of this trade which demanded that "the material is turned out just as the customer wants it." This in turn required a detailed survey of the production process and the comments of particular customers concerning the quality of the steel for various manufacturing processes.^{A9} For example, Kuehnrik referred to the Rotherham firm of J.J. Habershon &

Sons, who were making little profit on cold rolled steel because they failed to conform to the specialist instructions of their customers; they provided no record of customer comments, or instructions to foremen, they believing that "what is good for the one is good for the other." Thus the advantages accruing from a new plant would be to gain a competitive edge on older works, and given their expertise in producing a higher quality product they could conform to the specialist demands of customers.⁵³ This clearly represents an example of Moss's inducement effect where changes in the market specification of commodities focussed managerial attention on the need to develop new product areas and carefully monitor customer demand.

The demand for uniformity in quality led to a response by more progressive firms in the area of scientific methods of testing and research and development. According to Tweedale, "rule of thumb methods predominated" in the nineteenth century, the links between science and industry were tenuous. This proved a considerable drawback to entrepreneurs who found that "The channels for systemising and formulating knowledge and for replicating results were lacking." However, the technical requirements of specialist steel production saw the development of research labs which provided a "seedbed of technological development."⁵⁴ The American Machinist in 1912 noted the tendency towards scientific investigation of the mechanical and chemical properties of steel and provided a description of

developments in the works of Spear & Jackson where,

A special section ... has lately been equipped with complete plant for the mechanical, chemical, and microscopic examination of materials used, so that they can be checked from the ingot to the complete tool ... The whole system, when complete, will probably form as elaborate an organisation as will readily be found in a works of this kind.⁰³

The above examination in relation to the business firm would suggest a market response based on producing for order rather than stock. In other words, the specialist requirements of the market reduced the ability of firms to instigate a system of operations geared towards large production runs. This was further reinforced by the wide range of products produced by Sheffield firms, which was particularly true of cutlery. The emphasis on quality in the marketing strategy, it has been argued, was an attempt to differentiate products. According to Moss, "A differentiated product is one which as a more or less loyal group of buyers ... who give preference to the firm producing that product over the similar products of other firms."⁰⁰ Indeed, if commodities are physically identifiable in the market it is difficult to perceive of an undifferentiated product. Thus every seller is exchanging a differentiated product, even if the actual commodity sold is physically identical.

In cutlery, it was the quality and design of the product that was the focus of selling and differentiated it in the market. But as argued earlier, standardisation was introduced not by product but by brand. Indeed, Sheffield cutlery firms

produced a staggering range of cutlery products and a wide diversification of similar product lines, differentiated by pattern, quality and price. For example, Pollard, describing the Sheffield light trades in the 1850's has claimed that "each narrow trade, in turn produced goods of innumerable patterns and qualities, few of which had a mass market.⁶⁷ Thus, Sheffield's structural base did not lend itself easily to product standardisation. A study of various pattern books lends support to this view. For example, Christopher Johnson's displayed a staggering range of branded cutlery goods for sale, their list of general table cutlery alone offering 53 different types of knives differentiated by quality and price. Similarly, the large firm of Southern & Richardson, as late as the 1920's, produced numerous articles ranging from knives, forks and scissors to table ware; one of the firm's pattern books displaying 105 different kinds of table cutlery.^

This of course relates back to the arguments concerning the development of Sheffield's resource base and the uneven pattern of mechanisation. G.I.H. Lloyd claims that prior to 1914 a number of large cutlery firms had introduced auxiliary mechanical aids for facilitating the latter stages of cutlery manufacture, such as used in Germany, and by 1911 a number of specialised firms supplying machine forged and flined parts for cutlery manufacture, "organised on modern large-scale factory lines", had emerged.^ In fact, the larger business units had increasingly integrated their production processes by excluding

outside specialist producers of components such as blades, handles, blanks etc.⁷¹ Thus, process specialisation is centralised within the firm itself and this would seem to reinforce the tendency towards product specialisation. However, the process of development did not follow this trajectory.

In an account of Sheffield's cutlery trades, written in the 1950's, H. Townsend noted the continuation of process specialisation. Taking the example of specialised forging by firms, he argued that the main advantage accruing from specialisation was in the sphere of organisation. The existence of specialist forgers led to "the centralisation of the industry's stocks of blanks." Thus specialist forging firms carry numerous stocks of blanks which imparts a greater flexibility on the later stages of production which would be costly to achieve directly. However, specialisation by process encouraged the creation and perpetuation of product distinction "and precludes spontaneous experiment in standardisation."⁷² Of course, if firms were developing integrated operations we would expect that this should encourage product specialisation. However, as Townsend argues, even in integrated firms the development of a standardised product was limited as it is only "possible where large orders for single patterns are available, chiefly amongst the lowest priced lines."⁷³

The market, therefore, determined the process and organisation of production in the cutlery trades. This relationship also affected the size structure of the industry.

The emergence of economies of scale in relation to market size is well known in economic theory. As Bagwell and Mingay claim,

The size of the productive unit was influenced primarily by the size of the market, the nature of the product and of the productive process itself, and how far these lent themselves to production methods offering economies of scale with consequent reductions in unit costs. ^

According to these authors, the early acceptance of standardisation and mass production methods in the USA, together with a rapid growth in the size of the market and its homogeneous character, largely accounts for the larger size of US firms over their British counterparts. The reliance of Britain on overseas markets which were "various and changing" offered less opportunity for developing standardised production, and the reliance of firms on selling through individual middlemen "reduced the possibility of mass-producing a more limited range of goods.

These characteristics are clearly evident in the cutlery trades. Sheffield producers manufactured a great variety of cutlery products often going to unnecessary lengths to meet specialist demands. Firms produced to order which limited the procurement of stock, and longer production runs. We have already noted the wide range of products produced and this was in marked contrast to the practice of US cutlery firms. For example, as early as 1871, the Sheffield Independent noted that US producers were forging into cheap standardised products:

The Americans choose a few good popular styles, they invent and use machinery for every process possible, they put in a good blade, neatly ground, splendidly marked, and

turn out every knife the precise duplicate of every other. Hence the uniformity, reliability, and general style which is in ,no Sheffield goods except those of standard makers.^{7°}

Thus, the trend was towards the manufacture of cheap standardised cutlery and as the American Cutler claimed in 1909, the "demand for all kinds of merchandise is for cheap goods."^{7^}

Sheffield firms, however, were slow to respond to these trends. Even in 1931, the question of standardised sales and the use of intermediaries in the US market was a matter of considerable concern to the management of Wostenholme's. In a report from their New York agent, George W. Davis, the directors were advised that they should develop "factory representation under experienced men" and exclude the use of "jobbers, who divide their efforts on various lines." The basis of the argument was that the use of the sales jobber reinforced the tendency to sell "too many lines", and as Davis argued there was a limit to what the market could bear. This left little scope for marketing economies and Davis advised that the company should reduce its product range by 25% and increase the sales of the remaining items. For example, he referred to the "IXL" brand which should be condensed by concentrating on a number of specified items in each product line and "revamped" to the specification of the most popular design. This would bring the "items up to date with what is known as the American standard" which reflected both the tastes of consumers and the product knowledge of producers. According to Davis this was now

essential as the market for cutlery was divided between a demand for "the very cheapest and the very best."

The essential point, therefore, is that Sheffield cutlery firms moved only slowly to the standardisation of product lines and the realisation that markets were being conditioned by cheapness as well as quality was just as true of the pre-war period as the 1930's. From the 1880's Sheffield cutlery firms faced growing competition from cheaper standardised producers both in the USA and Germany. The problems of introducing standardisation was also an issue which faced firms in the steel and tool and heavy engineering sectors. Landes, for example, argues that in engineering the British were slow to adopt uniform shapes and sizes and the peculiar institution of the consulting engineer meant that they "tended to design every project as though the manufacturer was a custom tailor working in metal.

This question of designing a product to meet national norms was recognised by the Sheffield Chamber in 1903. Increasing competition and lagging sales had led to the formation of the Engineering Standards Committee, under the guidance of the leading engineering associations in 1901.⁹⁰ According to a representative of Charles Cammell's the industry would have to meet increasing competition by complying with accepted standardised norms. This implied an agreement between users and producers of material "as to a certain number of types or articles in respect of dimensions or sections, and

also to the quality of the material and the tests to be applied to ascertain it."®^ This therefore called for a more rational and scientific approach by management to the question of product standardisation which according to Cammell's would increase the competitive position of Sheffield's steel sector:

There was no doubt that such an agreement would have a tremendous influence on trade by cheapening production, enabling the manufacturer to arrange his work for the current production of these standard types, and preventing delay by facilitating the work of the designer, the manufacturer, the inspector and the user. ^

However, standardisation was difficult to enforce, particularly given the organisation of production where the design engineer was divorced from the shop floor. Thus, the American Machinist noted, in 1913, that this was common in UK firms and militated against quality control and product uniformity.^3

However, this is not to suggest that there was no movement towards standardisation, especially in engineering.^ Indeed, standardisation was an obvious strategy for firms in the steel and tool trades faced with market and resource constraints. An example is provided by John Kenyon & Co. Founded in 1710 and effectively managed by an owner manager, William Waterfall since 1596, the firm became a private limited company in 1909 and in 1910 bought out the firm of W.A Colley Ltd., steel manufacturers and merchants, with the desired aim of providing "further assistance in the management and to develop business in new markets." 100 A major factor in this purchase was the acquisition of additional melting capacity for crucible and high speed steel production which previously had been

contracted to the firm of Whitley, Whitham & Go. This now allowed the integration of specialist steel production with tool fabrication. in 1910-11, it was noted that the company had increased its employment threefold since 1896 and had made every effort towards the "modern tendency" of specialisation, its products now covering "a somewhat narrower range than in previous years."®'7

The reasons behind the managerial decision to expand output and reduce commodity lines was emphasised by the management in 1910. Attention was focussed on efforts to reduce imbalances on the production side of operations. Since 1906, the expansion of the sales side of the business, particularly the increasing demand for high speed steel saws, had outrun the productive capacity of the firm's plant and equipment. Increasing capacity was essential to the firm in an highly competitive environment where they "found that customers only gave ... large orders partly so that they could depend on a portion being delivered in time for their requirements." Thus success in meeting increased competition from local manufacturers and Germany dictated an increased intensity of production and this was achieved by changes in the physical and human resource mix of the firm.®® In announcing a record yearly net profit of £13,888 in August 1910, the Chairman William Waterfall argued that this had been

principally brought about by the high prices obtained ... increased turnover and increased machinery, more efficient management, also where possible piece work has been put in

force ... The whole works are now in a very good condition for turning out goods quickly. y

However, this increase in the resource base of the firm could also induce a managerial response to the need to carefully monitor market demand. For example, a fall in demand in the second half of 1910, coupled with the fact that customers were over-stocked, meant the firm was operating at over-capacity and prompted management to call for an intensified sales drive.^0

Similar problems were encountered by Spear & Jackson who found difficulty in penetrating the Canadian and Australian markets because of the irregularity of supply and the inability of the works to meet the increase in demand for steel tools. For example, they informed their Australian agents that they had largely increased the manufacture of saws but "our increased production has not enabled us to keep pace with our orders as promptly as we would wish."^ In response to this imbalance, the firm acquired the saw manufacturing firm of Drabble & Sanderson in 1907 to augment the output of this article."2 Also, in the case of files the firm had difficulty combatting US competition in Canada, and although they had installed a new machine shop, they found difficulty in meeting orders promptly, which was a severe competitive disadvantage.®® The imbalance here was clearly related to the fabricating side of operations as they had ample capacity to supply quality steel for tools, having "overestimated" requirements in a new melting furnace costing £1,000 in 1904 and which was now only half utilised. This again emphasises that the reliance on

quality and producing to order could create coordination problems, given the cyclical nature of the market facing firms.

This chapter has identified the links between market strategy and resource development within Sheffield firms. The reliance on quality in the production process, and the market strategy surrounding this, has been identified. Sheffield firms, particularly in cutlery, were slow to adapt to the requirements of cheapness and product standardisation. In steel and engineering, the need to develop a more rational strategy in relation to the requirements of the market was a fact which was all too obvious to businessmen by the early years of the twentieth century, but even here the reliance on quality and tailor made products could be a serious drawback. To explore these factors further, an examination of the pricing and marketing strategies of three Sheffield firms is undertaken. This further highlights the difficulties faced by Sheffield producers in overcoming the competitive constraints of selling in a changing commodity market.

Notes and References

1. Sheffield; The Arsenal of the World (1916), p.31.
2. P.P7, 1886 (c4714), 21, Second Report of the Royal Commission on the Depression of Trade and Industry, p.100.
3. Ibid., p.106.
4. G. Tweedale, Sheffield Steel and America (1987), pp.23-9.
5. Ibid., pp.28, 67-78, 101-3.
6. Ibid., p.100.
7. S. Pollard, Britain's Prime and Britain's Decline (1989), p.30.
8. Tweedale, Sheffield Steel, p.102.
9. Ibid., Ch. 6.
10. Telegraph, 30 Jan. 1894. W.H. Brittain was the brother of Frederick and the senior partner in the firm of William Hall Ltd., Steel and tool producers, RV 1880, £220. See Quality of Sheffield, vol.28, no.2 (1981).

11. P.P., 1886 (c4714), 21, see evd of Thomas Vickers, p.108; evd of Samuel Osborne, p.105.
12. Telegraph, 30 Jan. 1894. The political debate over tariff reform is discussed in Chapter 7.
13. S.B. Saul, *Studies in British Overseas Trade 1870-1914* (1960), p.104.
14. E.J. Hobsbaum, *Industry and Empire* (1968), p.191; M. Kirby, *The Decline of Economic Power Since 1870* (1981), p.8. For a critique of the marketing practice of the key machine tool industry see R.C. Floud, *The British Machine Tool Industry 1850-1914* (1976), pp.88-95.
15. S.J. Nicholas, "The Marketing Performance of British Industry 1870-1914", *Econ. Hist. Rev.*, vol.37, no.4 (1984), p.491. UK export shares to Empire markets increased from 34.5%, c1880-4, to only 35.8%, c.1910-13. *Ibid.*, p.492; Saul, *Overseas Trade*, p.219.
16. Nicholas, "Marketing", pp. 490-2.
17. J.S. Jeans, *England's Supremacy: Its Sources, Economics and Dangers* (1885), p.305.
18. Nicholas, "Marketing", pp.504-5.
19. See O.E. Williamson, "Transaction Cost Economies: The Governance of Contractual Relations", *Jnl. of Law and Economics*, vol.22 (1979), pp.233-6!.
20. Nicholas, "Marketing", p.497.
21. P.P., 1886 (c4714), 21, p.8.
22. *Ibid.*, pp.6-7. Bessemer steel was largely produced from scrap, and worth about £4-5 per ton, while crucible steel contained a large proportion of best Swedish bar iron, and worth about £15 per ton.
23. *Ibid.*, p.6. Similar comparisons were made between hand and machine produced pocket knives, saws and files. Bessemer steel produced a product which lacked "elasticity, evenness of temper, keenness of edge and durability." *Ibid.*, pp.7-8.
24. *Ibid.*, p.8.
25. *Sheffield Independent*, 31 Jan. 1894.
26. SCL, *Records of Sheffield Chamber of Commerce (SCCM)*, LD1986(4), 5 Jan. 1897.
27. *Ibid.*
28. *Ibid.*, 12 Feb. 1897.
29. *Ibid.*, 27 Jan. 1898.
30. RV, 1901, £514.
31. P.P., 1908, *Truck Committee* (c4442), p.308. Similar arguments applied to cutlery. For example, a visit by W. Lyne, an Australian politician, to the works of Thomas Turner's criticized the bias towards hand techniques, which prompted the reply that "the special quality of Sheffield cutlery was due to the hard work of the skilled cutlers." *Sheffield Telegraph*, 7 May 1907.
32. *American Machinist*, vol.28 (1905), p.586E.
33. *Ibid.*, vol.36 (1912), pp.20E, 32E, 79E, 122E. For example, Firth's in 1911 were selling high speed steel under the brand of "Firth's Speedicut", which as made "a world-wide reputation for itself." *Thomas Firth & Sons Ltd.. Norfolk Works* (1911), p.1.
34. H.H. Bedford was a partner in J. Bedford & Sons, RV 1901j £551.
35. *Independent*, 3 Feb. 1906. *The American Machinist*, vol.29, 1905, p.114E, noted that "British tool makers are now sending twist drills of

high speed steel to all parts of the world ... it is certain that the best qualities of it have been made in Sheffield."

36. B. Elbaum & W. Lazonick, "An Institutional Perspective on British Decline", In Elbaum & Lazonick (ed), The Decline of the British Economy (1986), p.7. C.K. Harley & D.N. McCloskey, "The Expanding International Economy", in R.C. Floud & McCloskey (eds), Economic History of Britain, vol.2 (1981), p.68, argue that Britain's comparative advantage lay in traditional skills and experience.

37. SCL, Records of Johnson's, MD2374, Letter Book, Johnson's to J.W. Bundy (Melbourne), 23 Sept. 1886.

38. Ibid.

39. A. Raistrick, The Centuries Progress: Yorkshire (1893), p.109.

40. SCL, Records of Wostenholme's, Wos R144, Minute Book, Dec. 1887.

41. Ibid., Jan, March, May 1888.

42. Ibid., Nov. 1889.

43. SCL, Records of Spear & Jackson, SJC69, Letter Book, S & J to H.M. Howe (Durban), 14 May 1906.

44. Ibid.

45. S. Moss, An Economic Theory of Business Strategy (1981), p.146.

46. Ibid., pp.120-1.

47. Raistrick, Centuries Progress, p.109.

48. Moss, Business Strategy, p.121.

49. W.H. Fraser, The Coming of the Mass Market 1850-1914 (1981), p.146.

50. D. Laidler, Introduction to Macroeconomics (1974), p.93.

51. M. Casson, The Entrepreneur: An Economic Theory (1982), p.311; M.S. Albion & P.W. Farris, The Advertising Controversy (1981). p.75.

52. Wos R144, Letter from Cutlers Co. to Wostenholme's, 13 Nov. 1886.

53. Ibid., May 1887. As late as 1970, the firm proudly advertised that "These IXL knives are the finest quality Sheffield can produce - Just say which one appeals to you." Wos R27, Catalogues, 1970.

54. Wos R144, May 1887.

55. SCCM, LD1986(5), 8 Feb. 1900.

56. Ibid., 3 May 1900. See also views of the steel firm of Kayser, Ellison & Co., 8 Feb. 1900.

57. Ibid., 3 May 1900.

58. SJC69, S & J to B. Caryesford (London), 11 Jan. 1909. Also, S & J to F.B. Lee (Toronto), 14 Aug. 1906: "We prefer to sell steel at a higher price, as it takes no more in the making and there is more profit in it."

59. SCL, Records of Beardshaw's, MD7081(5), Minute Book, H. Spear, Report, 28 Dec. 1894.

60. Ibid., 20 July 1900.

61. Ibid., 20 Oct. 1897.

62. SCL, Records of Marsh Bros, Marsh 105, Papers Concerning the Effingham Steel Works, Memo Outlining a Project for Laying Down Hot and Cold Rolling Plant, Jan. 1896. A common practice was to send out samples for testing. See SJC69, S & J to Whiteman & Barnes (Canada), 23 May 1906: "We are now trying a different type of steel ... will send you a sample to test for quality."

63. Marsh 105, Memo. The firm eventually acquired the plant of the Effingham Steel Works.

64. Tweedale, Sheffield Steel, pp.34, 65.

65. American Machinist, vol.36 (1912), p.133E. This relates to the need for quality control as the results of tests "can be stated definitely to

workpeople."

66. Moss, Business Strategy, p.73.

67. S. Pollard, A History of Labour in Sheffield (1959), p.50.

68. Christopher Johnson & Co., Western Works (1899). Even in 1948, the firm still produced 27 types of knives, distinguished by three quality gradings, and a wide diversity of sizes and designs. Wos R25, C. Johnson's, Classification of pen and pocket knife patterns, Dec. 1948.

69. SCL, Records of Needham, Veale & Tyzack, NVT24, Price Lists and Trade Catalogues.

70. G.I.H. Lloyd, The Cutlery Trades (1913), pp.186-7.

71. Pollard, Labour, p.206, also refers to the growing fashion for canteens of cutlery which promoted the integration of cutlery and silver plating firms.

72. H. Townsend, "The Cutlery Trade", in D. Bum, The Structure of British Industry, vol.2 (1953), pp.386-7.

~73. ibid., p.387.

74. P.S. Bagwell & G.E. Mingay^ Britain and America: A Study of Economic Change (1987 edn), pp.170

75. Ibid., pp.170-1.

76. Cited in Tweedale, Sheffield Steel, p.128.

77. American Cutler, no.110, March 1909, p.8.

78. Wos R12(a), Letters Concerning New York Agency, G.W. Davis to F.B. Colver, 4 Dec. 1931. It was not until 1948, that Johnson's produced a condensed pattern book which formed the basis for the selection of a short list of patterns on which future sales could be concentrated. By this stage, survival depended on the rationalisation of product lines to provide "the widest possible range with the minimum number of patterns and parts." Wos R25.

79. D.S. Landes, The Unbound Prometheus (1969), p.315.

80. Ibid., pp.315-6.

81. Telegraph, 31 Jan. 1903. Reference was particularly made to the standardisation of Government contracts abroad, while Arnold Foster, an Admiralty metallurgist, concluded that there was a wide diversity in practice and design for Admiralty contracts.

82. Ibid.

83. American Machinist, vol.39 (1913), P.80E.

84. The American Machinist. p.27E, claimed that the large Sheffield firms had geared "all rolling mills to standard sections outside which an engineer need not go."

35. John Kenyon & Co.: Bi-Centenery Celebrations 1710-1910 (1910), p.12; SCL, Records of Kenyon s, 244/B1/1, Minute Book 1909-30, 18, 21 Dec. 1909.

86. 244/B1/1, 16 Nov. 1911.

87. Bi-Centenery, p.12; Times Engineering Supplement, 22 Nov. 1911.

88. 244/B1/1, 20 Dec. 1910.

39. Ibid., 24 Aug. 1910.

90. Ibid., 20 Dec. 1910.

91. SJC69, S & J to P. Robinson (Melbourne), 15 Dec. 1906.

92. Ibid., 18 Oct. 1907.

93. Ibid., S & J to F.B. Lee, 14 May 1906. Similarly Beardshaw's were informed that "You must carry ... a stock of ... patterns ... to enable you to make deliveries by return." MD7081(5), H. Spear, Report, 20 Oct. 1907.

94. SJC69, S & J to Lee, 14 May 1906.

The Marketing Strategy of the Firm: Three Sheffield Case Studies.

The previous chapter has identified the competitive constraints facing the firm and the strategies adopted in marketing and resource development. This chapter will explore more closely the competitive strategy adopted by firms in international markets by examining the surviving business records of three Sheffield firms, engaged in the cutlery and tool sectors of the industry. The usefulness of this case study approach¹ is that it provides an analysis of managerial development within a variety of business enterprises, and relates this to the wider constraints facing producers in this period. Furthermore, in the case of the last two studies, we can explore the marketing problems of firms entering Colonial markets. We start however with an analysis of the marketing strategy of the large cutlery firm of Wostenholme's in the USA, which will indicate that the company faced increasing problems in developing an effective marketing policy in this area before 1914. In other words, how did the firm respond to the changing conditions of this market, and what were the obstacles they encountered?

The organisation of the sales side of Wostenholme's business was based on a managerial division of responsibility. In 1885, J.C. Ward, a director of the firm, was appointed as resident head of the New York sales office having sole responsibility for the marketing side of the business,² leaving

the Sheffield side of the business under the direct control of J.C. Wing, the managing director of the company. This emphasises the human resource development of the firm with reference to marketing structures. That management realised the need to expand the human resources devoted to marketing is illustrated by an advert for the post of assistant in the New York office in 1887:

A manufacturing company in Sheffield with large trade in the USA is in want of an English gentleman to be their agent for the USA and to reside in ... New York - The agent would be introduced to an establishment which is in the sale business - for a few years he would be asked to take the second seat in the office with the view of going forward to the upper seat. A sole agent is not necessary ... should be of the age of about 30 to 45 years.³

The post was filled by Edward Beckett, who eventually took sole responsibility for the New York operations. As James Nixon, a director of the company argued, the quality of the person appointed was a key factor, and a sales manager required not only an understanding and "diligence" in accounting and book keeping but also "a mechanical training in the shops." Thus Beckett was initially trained in the razor department of the works, before being sent to the New York office.⁴

The function of the New York agency was to mediate with US import houses, the main form of sale employed by the company, to provide the Sheffield management with information on prices and orders, and to coordinate the financial side of the business with regard to sales. The use of overseas agencies in providing information on market trends was a key function in the process of exchange among Sheffield firms. A number of

Sheffield firms in various branches of the steel industry developed overseas agencies from the 1870's.⁵ Among them was the firm of Spear & Jackson who informed their South African agent, H.M. Howe, that "We are accustomed to receive statements regarding bad trade and depression, and to learn at times that orders are reduced in number and size."⁶ However, control over prices and orders could be a tenuous affair given the vagaries of market demand. Thus Spear & Jackson informed a potential Canadian customer in 1906 that, "In the present fluctuating state of the metal market ... we are unable to keep this offer open indefinitely ... as we cannot say as to whether prices will rise or fall at the next change."⁷

For Wostenholme's in the USA, problems of coordinating markets were particularly acute, especially given the ability of large US merchants to dictate the market. The company's competitive strategy revolved around discount pricing as a market weapon. The use of discounts was, in turn, related to the perception of quality as the major factor in the decision to buy. As Casson points out, in a market orientated to quality, the area of controversy is defined by the quality of rival products and how customers perceive product quality. Thus, "whichever product is perceived as inferior must be sold at a discount if its producer is to maintain his market share." In this case it is the perception of quality which governs the price rather than prices which govern the perception of quality.⁸

Discounting was extensively used by Wostenholme's in the US market, where favoured discounts off invoice prices were offered in return for quantity purchases and quick payment in cash. However, this type of policy was fraught with problems given the powerful competitive position of the larger US import merchants. For example, in 1895, the Baltimore importing house of W.H. Cole & Sons, was accused by Wostenholme's of underselling the New York and Philadelphia houses. Cole's had assured the company that an agreed price should not be undercut; however, although the goods sold to Cole's were not subject to a discount, they had reduced the net cost price by as much as 20-30%. This, according to management, distorted the market and was detrimental to the firm's efforts to provide "uniformity" in market pricing. Thus the managing director, J.C. Wing, complained bitterly that

"you have sold under cost price - and we are accused by our friends of giving you special terms - you should charge in every case a good profit on the cost price and in no case should this be less than 10 %."⁹

Wing concluded that it was "Better to make no sales than these at such low prices."¹⁰ This illustrates the problems of circumventing the market mechanism given the powerful position of the large merchant houses.¹¹

This problem focussed managerial attention towards the possibility of establishing structures of direct exchange in the US market. As J.C. Wing argued in 1896, "The tendency of the present day is ... towards reducing the distance between manufacturer and consumer ... we are somewhat behind the times

in not planning facilities in the way of bringing this about."¹² At first sight such a policy, involving as it does the integration of the firm forward into direct exchange, may seem irrational. Porter and Livesay, for example, in a study of the development of markets, demonstrate that producers often sell to a few jobbing wholesalers rather than to retailers in order to reduce credit losses and other market hazards. The advantages of selling to the wholesaler rather than to the retailer minimised the producer's risks of bad debt and reduced costs in exchange because he was dealing with a limited number of customers, who were well known and reliable.¹³ Indeed, Sheffield firms were becoming increasingly aware of the need to gain access to information concerning the reliability of the wholesaler. This led to the development of specialist firms which provided information to manufacturers on a service basis. For example, a number of Sheffield firms used the services of the Mercantile Agency for the Promotion and Protection of Trade, a Manchester based concern run by R.G. Dunn & Co. This agency provided a graded list of the financial strength and general credit worthiness of a number of Canadian and US wholesalers, and a business history of the concern. The information was "strictly private" and "for the exclusive use of the subscribers."¹⁴

However, the advantages of using the wholesaler in the USA were increasingly being undermined, inducing the management of Wostenholme's to move towards methods of direct sales. In other

words, the development of a sales organisation based on direct exchange offered the firm a larger market return. The rationale behind this strategy was put forward by Beckett in 1893, who informed the management that the company's products were being excluded from the US retail market "by the determination on the part of the jobbers of IXL to curtail the sale of our goods as much as possible." The solution to this was to develop direct links with the small jobbers and retail outlets. As he succinctly put it, "we should look after the little streams and the rivers will take care of themselves."¹⁵ The company should thus instigate an active advertisement campaign, circulating pamphlets¹⁶ which informed the small retailer of the company's main product lines and major suppliers.¹⁷

Such a policy, however, required the consent of the large wholesale houses, and the root cause of the problem was the ability of these large buyers to influence the type of commodity that the retailer purchased. Thus, according to Beckett, the company should actively pursue a direct link with the retailer: "we seem to have friends all over the United States and we ought to study their wants." He warned the management that if they knew of the number of persons who had gone into cutlery stores, enquiring about "IXL" cutlery, only to be told that "they cost too much we cannot keep them (they) would be greatly astonished." The large wholesalers were "educating the retailer to ignore our goods, and in selling other cutlery by which they can make more money."¹⁸

The direction of managerial policy was thus focussed on the power of the large merchant houses to manipulate the market in favour of cheap, low quality lines. For example, Beckett reported to the directors in June 1893 that the importing merchant house of Stauffer, Esheman & Co. had joined a US syndicate to purchase cheap cutlery and as a consequence had sold less of Wostenholme's goods. He further noted that the question of profit is their sole motive and they were "selling cutlery on prices alone, quality not being considered."¹⁹ Thus they faced increasing competitive pressures in a market which was being manipulated towards lower priced products. As Tweedale argues, US demand was conducive to the introduction of cheap, medium quality cutlery, produced to standardised patterns, and this virtually extinguished Sheffield competition in the second half of the nineteenth century. Furthermore, the vast expansion of the US market saw the emergence of wholesale hardware trade associations and department stores selling advertised branded products, often through controlled retail outlets, which led to fierce price competition and pressure on Sheffield's traditional marketing techniques.²⁰

In turn, these issues were related to the use of discounting and the need for uniformity in pricing policy.²¹ Prior to 1895, Wostenholme's had adopted quantity and cash discounting²² as a means of increasing sales in the US market. Discounts were thus offered to firms who could guarantee large orders which tended to alienate the small jobber. In a letter

to the large New York importing house of F.B. Gurney, Wing outlined the problems attached to a policy of offering special terms. He claimed that the use of discounting reduced the number of direct customers, compelling them to buy cutlery via the large importer "who offered them better terms than the arrangement we bound ourselves by." The result was a drift of the trade towards the large importer, which led to cut throat competition. The large houses "competed with each other so severely that profits were reduced to a minimum, and one house now buys nothing from us and the other simply uses us for their own purpose."²³

Thus the use of quantity discounting militated against a strategy of developing a wider market base, which the management argued reduced the risks of selling, and it was now impracticable to continue quantity discounting "when the conditions are radically altered." It was clearly to the company's advantage to encourage direct contacts as "the more direct importers we secure, the more generally will our goods be used , the more demand there will be for small orders from stock in New York." The aim behind this was to create a uniform basis for "a satisfactory and stable trade."²⁴ The policy was no longer geared towards fixing import prices and "bolstering up" a few large merchants by extra quantity discounts but now to persevere in extending the direct lines of exchange.²⁵

This was clearly viewed as a response to economic depression and the financial difficulties of the firm. The

stagnation of US sales and an increase in stock levels had reduced working capital to the point where "we are horribly short of money." Thus, given the downturn in trade of 1895, special discounts were inappropriate as even with the discount "it is not expected that there will be a very large business at present, as I do not think that orders can be had at any price."²⁶ As the management informed Herman Bocker & Co. of New York, in reply to a request for special cash terms, such discounts had been offered on the grounds of encouraging an increased business while orders from the company had actually declined, and the management demanded that future remittances should be within 30 days as "We are ... very short of money at present, and it is inconvenient to have cash locked up."²⁷

However, a strategy of direct exchange and the removal of special terms, as a means of enforcing uniform competition, was difficult to impose on the trade for two reasons. Firstly, the large importers resisted attempts to bypass the recognised channels of trade. For example, F.B. Gurney bitterly denounced the policy of Wostenholme's agent selling directly to his retail customers on the same terms they offered him, and claimed that this was poor business practice:

I am a customer of yours and am entitled to good usage ... and for your man to go to any customer of mine and offer the goods at the same price I buy at is not good usage ... As I understand it is new trade that IXL want and not to kill that they already have.²⁸

The reaction to Wostenholme's tactics could be hostile; the Simons Hardware Co.²⁹, for example, reduced their prices to

retailers by 5% in 1896 and, as Wing warned, this was detrimental to the trade, leading to claims of unfair competition from other leading merchants, and a general demoralisation of prices and profits.³⁰ For example, Baker & Hamilton of San Francisco complained of price undercutting by the New York trade and condemned Wostenholme's for "favouring that class of customer." These large importers "feel as though they owned the entire cutlery trade of the United States" and they are "responsible for the introduction of so much German trash, made in imitation of your patterns, which the American market has for years been flooded."³¹

Secondly, uniformity in pricing was undermined by Sheffield firms offering higher discounts in an effort to compete with the higher quality of the company's products. In 1895, H. Wolf & Co. of Chicago informed the directors that W. & S. Butcher and several other firms had offered an extra $2\frac{1}{2}\%$ discount off the invoice price and extended the credit terms to six months. In reply, they argued that such action worked against the general interests of the trade "and we are strongly wedded to the principle of treating all our customers alike."³² A previous 5% reduction by Butcher's, in an attempt to increase market shares, had forced Wostenholme's to follow suit, but now the directors argued that the extra discount meant a considerable reduction in profit margins. Such a policy was "unsound" as Butcher's were badly off for orders, had accumulated immense stocks, and when trade revived

Wostenholme's would be able to raise their prices and compete on the basis of superior quality.³³

This provides an example of Moss's inducement effect whereby competition between firms focusses managerial attention on new markets and methods of producing commodities for existing markets. In the case of Wostenholme's the managerial response was to emphasize the higher quality of their product and to offer to modify their price discount structure to special customers in the USA.³⁴ As Wing argued, Butcher's could not produce the same high quality goods "as cheap as we can do. No more can anybody else. Needham's are trying to, but they have had to come down to flied blades."³⁵ Thus they argued that uniformity in market pricing in turn favoured the maintenance of quality standards. Thus Sheffield firms were willing to dump goods in depressed years to maintain trade in the US market, using discounts as a market weapon. However, for high quality producers, such as Wostenholme's, this restricted their efforts to maintain prices and to create uniformity in sale.

The above study of Wostenholme's marketing strategy in the USA illustrates the gradual movement to establishing direct links; however, the restrictions of the market constrained the efforts of firms in this direction. The power of the large wholesale houses, and the problems of uniformity in a market geared towards the introduction of cheaper brands, limited the company's aims to establish lines of vertical integration

backwards into direct exchange. Furthermore, it restricted attempts to accumulate large stocks in the US market, which was to allow US manufacturers a clear advantage in producing mass produced, ready to order cutlery.³⁶ Similar strategy problems were to face the firm of Christopher Johnson's in the Australian market, especially in terms of product diversification. In contrast to Wostenholme's, this firm provides an example of the business strategy of firms at the medium size end of the market.

This firm was founded in 1836, and produced a variety of table cutlery as well as tools and files.³⁷ The firm sold largely in Australia and New Zealand but from the mid-1880's extended links into the Far Eastern market.³⁸ Like Wostenholme's, they sold through intermediaries which reduced the risks of market transactions. For example, in a letter to T.O. Allamby, an Indian merchant, the management claimed that to compete, prices were arranged to secure a narrow profit margin and therefore "we can only trade with merchants and wholesale buyers" who could guarantee both large assignments and prompt orders.³⁹ Again, discounting was extensively used to provide incentives for bulk purchase,⁴⁰ and as a means of introducing quality into the market at the cheapest price. The policy of the company, claimed the managing director J. Marshal, was "to charge our goods that they should be laid down abroad at the cheapest possible figure."⁴¹

However, the use of discounting again undermined the

management's attempts to create uniformity in competition. In 1886, Marshal informed William Cowlinshaw, the company's Australian traveller, of the satisfactory nature of this trade but warned against merchants who were continually demanding special terms for cash discounts which undermined the rules of uniformity. The solution to this was to move towards a policy of direct sales, through the Australian agency, to large retailers:

Depend upon it our plan is the right one for the large retailer, and therefore it must be right for us, for it is quite certain that the middleman is being extinguished everywhere, quietly it may be, but none the less surely ... the time will come ... when he will be but sparingly patronised.⁴²

The advantages of direct trading were to reduce the commission costs of transactions and to install a rule of uniformity in pricing which would create business confidence when trade conditions revived. This would require, however, "a more energetic marketing policy" to attract new business in this market.⁴³

The strategy of this firm in the 1880's provides an example of the diversity of the smaller business unit. The company was an integrated concern producing not only cutlery but also tools and steel.⁴⁴ From the 1880'S the firm developed a strategy of joint exchange by promoting the steel and tool side of the business. Furthermore, they utilised their marketing expertise and knowledge to sell other firms' steel, taking on a specialist merchanting function in conjunction with manufacturing operations.⁴⁵ For example, they sold bar iron for

the Sheffield firm of S.H. Burrows & Co.⁴⁶ in New Zealand and mediated for this firm in exchange transactions.⁴⁷ Johnson's sold a wide selection of small size intermediary steel products ranging from spring steel to common rounds and squares, special Bessemer steel and bars, mild steel sheets and strips, octagon steel and plough plates. The firm's steel plant was thus planned to produce "made to order" steel products for the specialist Australian market.⁴⁸ But how did the company promote this secondary side of the business?

Similar to cutlery, the question of quality in steel sales was at the forefront of market calculations. The price standard set by the firm was based on notions of quality and "If we reduce quality and price they would only come down in proportion." For example, octagon steel, in Australia, was being sold by large importers at £44 per ton and Cowlinshaw advised that the company should sell at a lower quality standard of £30. This was firmly rejected by management who advised Cowlinshaw not to commit them to this standard "as we already have two large orders at £36." The standard should be maintained at £36 per ton and quantity discounts of 7½ to 10 % offered for orders over 10 tons, smaller purchases being charged as usual. Thus discounts were used to segregate the market between large and small buyers, allowing the large importer a sufficient margin of profit and the competitive power to undercut small importers.⁴⁹

However, the demand for lower quality steel in this market

brought to the attention of management the possibility of segregating markets geographically. A study of price cutting tactics by Millman has suggested that "Among the reasons why companies are attracted to exporting ... is price discrimination through geographical and market segregation."⁵⁰ This was clearly an option adopted by Johnson's who introduced a policy of "second quality selling" at £30 per ton, undercutting their standard price of £36 for octagon cast steel. This was based on the premise that the Australian and New Zealand markets could absorb a lower quality product; however, the firm was careful to defend its reputation and although admitting that "a lower quality could be supplied ... we could not put our flag on it, neither should we warrant anything below £30."⁵¹

The example of a medium size firm, such as Johnson's, diversifying its sales lines suggests that the smaller firm could alternate its productive resources to meet market changes. A characteristic of small firms is therefore their flexibility, their ability to adapt to changing market demand.⁵² The ability to switch into new product lines is however dependent upon the technological parameters of the firm. The technology and skill embodied in producing cutlery was similar to that required for tool production and thus the possibility of switching was open to firms utilising less expensive production methods. For example, in the 1880's Johnson's attempted to promote the sale of tools, especially

files, in conjunction with their cutlery business.⁵³ However, although the firm could switch production resources easily the company faced considerable resistance to their tools in the Australian market. As Penrose has argued, it is possible that the opportunities open to smaller firms are severely limited, not by the quality of their resource use, "but by impassible barriers existing in the environment." In particular, the competitive power of large firms restricts the expanding opportunities open to the smaller business unit.⁵⁴

The attempts by Johnson's to promote the sales of files in the Australian market was restricted by the competitive advantages of large scale producers. The use of discounts on files was a weapon used by large Sheffield firms to undercut smaller competitors. Thus the management referred to the extreme discounts on files being offered by Thomas Firth & Sons⁵⁵ and complained that they "sold more millsaw files in New Zealand than all other Sheffield houses put together why should we with an equally good article have to go so much above them?"⁵⁶ This in turn was affected by the logistical problems of using discounts as a means of increasing market shares. As Millman claims, discounting represents the easiest way of administering prices but requires "the sales manager to keep a sharp eye on the arithmetic of money and proportional discounts, and monitoring the behaviour of buyers prone to changing their order pattern and delaying payment to the last possible moment."⁵⁷ Large firms, with greater financial and

market resources at their disposal, could monitor the market more effectively and in times of slack demand could bear the financial risk of large discounts to maintain market shares.

In the depression of 1886, the management complained that "Business ... continues very, very bad ... we have no orders at all for files"⁵⁸ and wrote to their New Zealand agent on the question of competitive discounting:

We feel there will be little chance for us so long as our discount is so much below that of some of our competitors, unless indeed you can influence buyers in our favour, which we can hardly expect. But what are we to do? With 60% & 3% delivered f.o.b. London ... there is certainly some profit, but to go beyond that would in very many lines lead us into actual loss, and this would be the case in every description of saw files.⁵⁹

Similar to Wostenholme's, competition jeopardised the firm's attempts to introduce uniform pricing, which in cutlery "is well known to all our clients."⁶⁰ However, in the case of files the firm was forced, due to competitive pressures, to offer higher quantity discounts, for orders over £200, of 61½% for ordinary files and 60% for saw files. This, argued the management, was the optimum discount, allowing a return on outlay, and providing a short-run response as "the high discounts ... will very soon come down with the first rush of good trade."⁶⁰

The question of discounting was again related to the issue of quality. As the management argued, the use of extreme discounts of up to 65% and 5% on files must necessarily reduce quality in order to maintain profits. This damaged the reputation of the product in the eyes of wholesalers, allowing

them to compete effectively with best quality producers who were attempting to sell directly to retailers. The management concluded that "in the long run and especially in good times, quality should win the day."⁶¹ However, from the 1880's the file trade was subjected to mechanisation,⁶² and files were used as loss leaders by the larger Sheffield firms. The Sheffield Trades Association, for example, giving evidence to the 1886 Select Committee, referred to the depression in the file trade and linked this to firms forcing the article into the market "at a cheaper rate than what otherwise it would have been sold for." Larger firms were using files as "leading articles" in an attempt to induce orders for higher value products. The development of cheap machine produced files facilitated this process and "hence the efforts to produce files cheap have been most strenuous."⁶³

The example of Johnson's illustrates the market problems of smaller firms in competition in the Australian market. Indeed, given the problems encountered by this firm in promoting the file side of its business, we would expect potential new entrants to face severe market resistance. In a recent text book on sales methods, Cannon and Willis claim that "Many of the most exciting challenges to business come from expansion and growth." In particular, entering new export markets offers a route to growth; however, this carries with it a risk element and "requires a gathering of all the available information on the growth options open to the firm and then, on

the basis of this information, a reasoned discussion on the way forward."⁶⁴ Therefore, expansion into new markets involves the development of a chain of relevant business information on the potential of new markets and a coordinated strategy of market penetration. As an example of these problems, the opening up of trade by the Sheffield firm of Burgon & Ball provides an ideal case in point.

The firm was founded in 1860 as a co-partnership between W. Ball and W. Burgon, to produce sheep shears, edge tools, crucible steel and cutlery. In 1894, the company went public and in 1898 purchased the firm of William Wilkinson Ltd.⁶⁵ Operating from the La Plata works, Malin Bridge, the company from its formation was geared to expand the production and sale of shears, particularly in Colonial markets, although they also established sales agencies in South America and the USA. In the company's early years, they had to overcome the competition of established Sheffield firms and the prejudice against their product by Colonial buyers. For example, in a letter from Dalgety & Blackwood, a Melbourne wholesale house, the company was informed in 1872 that "we cannot dispose of any large quantities (of sheep shears) as this demand is principally for Ward and Payne's make."⁶⁶ The major area of sales resistance centred on the established reputation of Ward & Payne's make, and "we hear of conflicting accounts of the quality of your make though they are fairly well liked."⁶⁷ Indeed, such was the initial resistance to the product, that the firm was forced to

sell by public auction.⁶⁸

The openings in the market were to be established by developing effective lines of exchange and by producing a superior quality article. In 1868, W. Burgon had established links with the London exporting firm of Mclean Bros. & Rigg, who operated in Melbourne, and forged a number of sole agency agreements with foreign based export firms.⁶⁹ According to Mclean Bros., the penetration of the market depended on producing the right kind of quality article and "steel of good temper."⁷⁰ The market was thus to be secured through resource development in producing a superior quality product and as John Swine & Co. of Liverpool informed them "there is room for another brand now that Sorby's are not in such good reputation."⁷¹ Thus market constraints focussed managerial attention on improving the quality of the product. For example, between 1865 and 1873 the company introduced a number of improved production methods for manufacturing sheep shears under various patent rights.⁷²

In terms of distribution, the shears were placed in the hands of large ironmongers who dispatched samples to the shearing stations with their regular orders. This method of promotion had been successfully used by Ward & Payne⁷³ and was a common technique used by Sheffield firms. Samples were sent free to potential customers and were then checked for quality and durability before an order was offered. The use of samples to promote trade was crucial in a market where seasonal

fluctuations in demand obliged management to promote goods during the off season.⁷⁴ However, this could put increasing pressure on the production side of business and thus required management to carefully monitor potential demand.⁷⁵

The early experience of this company thus focussed managerial attention on the need to maintain quality, produce regularly to order, and promote trade through merchanting houses. A need for close managerial supervision of the market was demonstrated in 1887 by the appointment of William Burgon's son, Fredrick, as a travelling salesman in the Australian market.⁷⁶ The aim of this move was to promote the company's traditional markets for sheep shears and to diversify into new product markets for crucible tool steel, edge tools, and cutlery, which required an effective flow of information.⁷⁷ Furthermore, Fredrick was now actively engaged in negotiations for patent rights for sheep shearing machines, which were to be an important future business for the firm. However, the promotion of new business was restricted by the prejudice in favour of US steel and as Fredrick argued, "I do not see at present much business as no one will attempt to look at anything but American steel, even when it is cheaper."⁷⁸ Clearly then the restraint on the firm related to the competitive advantages obtained by established US firms in the market. This was also evident in attempts to promote the sale of steel shovels, where producers such as Ward & Payne of Sheffield and A. & E. Parkes of Birmingham, had copied the

cheaper US patterns and were underselling the higher cost Burgon & Ball designs by 6s per item, and selling all patterns at a uniform price.⁷⁹

In particular the company's efforts to enter the tool steel market encountered fierce resistance, and although Fredrick could argue that in the long-run, steel of a high quality "will advertise itself by its superiority", he remarked on the fact that "the Colonies are inundated with representatives from Sheffield and other parts of England and America and what with bad trade and keen competition it is most difficult to get in at all." Indeed, the company had developed close links with the Sheffield steel firm of Daniel Doncaster's and was simultaneously promoting this company's steel, using their reputation to sell their own surplus stocks of 50,000 tons of blister steel. This, however, had its drawbacks, buyers being inclined to misconceive the firm's position as an exclusive producer of their own steel.⁸⁰ Nevertheless, the ability of the firm to push sales and to provide high quality steel led to considerable success in penetrating the Australian market by the end of 1887, although difficulties were encountered in securing repeat orders.⁸¹

Steel, however, was not to be the major product area of this firm. After 1888 they developed extensive sales connections in the Australian, New Zealand and South American markets for the marketing of patent shear machines and edge tools. By 1898, the ability of the firm to develop its

technical skills, to invest in new capacity after its flotation as a public company in 1894, and to produce quality machine shears, which had first been patented in Australia in 1887, had virtually captured the Australian market for this product.⁸² Thus the success of the firm was linked to product specialisation and the ability of management to perceive fast growing areas of demand. As early as 1888 Fredrick had urged the introduction of mechanised shears as "sheep shear manufacturing in 5 years will be a thing of the past."⁸³

Equally important in the development of this firm was the expansion of a specific merchanting function. In 1888, Fredrick had perceived that the sale of steel could only be effected through the development of links with large import houses. However, specialising in shears and garden tools opened the possibility of circumventing the middleman, buying for import houses and trading direct with retail outlets in Australia. As he urged William Burgon, "you must go past the merchant and be a merchant yourself." This of course meant an increased risk of bad debts, and the alienation of large import houses, but would hold out the opportunities of expanding the market and selling other firms' steel and fabricated products, which would allow the company to acquire information on the prices of foreign commodities.⁸⁴ Furthermore, direct sales of garden tools would allow the firm to break down the monopoly of larger producers who had created an indentured trade in their relations with large importers.⁸⁵ The development of the merchanting side of

the business was to have two advantages. Firstly, it allowed the firm to develop a market quickly for the sale of mechanised shears which expanded rapidly after 1898,⁸⁶ and secondly to use this expertise to secure revenue by selling other firms' products. In the 1890's, the firm set up a number of sole agency agreements with Australian houses and in 1903 purchased the firm of J.H. Young & Co. of Sidney, which was established as a sales subsidiary of the firm.⁸⁷ The firm now expanded its merchanting function by negotiating agreements for them to sell and market a variety of other firms' products, especially engineering products which could be marketed and serviced in line with their own equipment.⁸⁸

The three case studies have highlighted a number of general similarities. Firstly, all firms were constrained in market transactions and the growth of cheap mass produced standardised goods placed firms at an increasing cost disadvantage. The slow adoption of standardised production was a clear indication that firms failed to respond to changing market trends, especially in the important US market. Secondly, firms displayed a clear trend towards direct marketing, and in the case of Burgon & Ball in Australia, this had clear advantages. However, the constraints placed on the firm by the increasingly organised nature of the market was clearly evident in the case of Wostenholme's, who found it difficult to circumvent the large middleman. This chapter has explored marketing strategy from a case study approach, but we have

noted that firms were facing competition of an increasingly protectionist nature. The next chapter explores the nature of this constraint in relation to the political response of Sheffield's business community to the question of competition and tariff reform.

Notes and References

1. Case studies of individual firms have shaped a great deal of the literature on business history. However, the need to generalise from comparative studies is now clearly emphasised. See B. Supple, "Introduction: Approaches to Business History", in B. Supple (ed.), Essays in British Business History (1978).

2. The appointment of directors in charge of foreign agencies was common among Sheffield firms in this period, and one suspects that this was instigated to exclude outsiders from the operations of the business.

3. SCL, Records of Wostenholme's, Wos R144, Private Draft Minute Book, 1886-90. Sept., Nov. 1887.

4. Ibid., July 1888.

5. See G. Tweedale, Sheffield Steel and America (1987), p.171. See also the records of Needham, Veale & Tyzack, SCL, NVT10, Agreements with Agents 1907-1923; Cooper Bros., 499/B1/10, Miscellaneous Volume, containing a number of contracts for the establishment of sole agencies abroad.

6. SCL, Records of Spear & Jackson, SJC69, Letter Book 1905-24, Spear & Jackson to H.M. Howe (Durban), 14 May 1906.

7. Ibid., Spear & Jackson to Whiteman & Barnes Manufacturing Co. (Canada), 23 May 1906.

8. M. Casson, The Entrepreneur: An Economic Theory (1982), p.320.

9. Wos R3, Letters to America 1895-96, J.C Wing to W.H Cole (Baltimore), 13 Feb. 1893.

10. Ibid. See also J.C. Wing to W.H. Cole, 25 Sept. 1893, where they were warned that they were "underselling to the general disgust of the trade ... If you cannot sell ship all the stock to Mr. Beckett and let us close the arrangement."

11. Cole's were clearly practising market discrimination by underselling in the Southern States to the annoyance of Wostenholme's Northern contacts, and "we ... beg of you not to take orders except at a satisfactory profit." Ibid., J.C. Wing to W.H. Cole, 6 July 1895.

12. Ibid., J.C. Wing to J.E. Pilcher (Managing Director, Simons Hardware Co., Saint Louis), 21 May 1896.

13. G.P. Porter & H.C. Livesay, Merchants and Manufacturers: Studies in the Changing Structure of Nineteenth Century Marketing (1971), p.223.

14. NVT18, Reference Book Supplied by the Mercantile Agency, Manchester, 1884.

15. Wos R12e, Journey Reports of Edward Beckett in the USA, E. Beckett to Wostenholme's, 23 June 1893.

16. The presentation of trade catalogues was described by the American Machinist, vol.30 (1906), p.31E, as "Amateurish in comparison to German producers who provided a larger range of products and catalogues printed in four languages."

17. Wos R12e, E. Beckett to Wostenholme's, 23 June 1893. A strategy of direct sales also held out the possibility of exploiting the retail sector as small jobbers often operated retail departments in connection with their wholesale business "and sell in the course of the year a number of fine lines." Ibid.

18. Ibid., E. Beckett to Wostenholme's, 1 June 1893.

19. Ibid.

20. Tweedale, Sheffield Steel, pp.132.171.

21. As Wing argued, the company must await "uniform prices and uniform competition." Wos R144, Dec. 1887.

22. Discounts are defined as reductions from a price list and fall into three categories: trade discounts in agreement with an intermediary as to functions performed; quantity discounts "based on individual orders and cumulative orders placed over a period of time; cash discounts as an inducement to pay within a given period. A. Millman, "Price Cutting in Perspective", Business Economist, vol.15, no.1 (1983), p.33.

23. Wos R3, J.C. Wing to F.B Gurney (New York), 20 March 1895. See also J.C. Wing to the Simons Hardware Co., 23 March 1895.

24. Ibid., J.C. Wing to F.B. Gurney, 20 March 1895.

25. Ibid., J.C. Wing to J.C. Ward (New York), 27 Feb. 1895.

26. Ibid., Wostenholme's to F.B. Gurney, 16 Jan. 1895; J.C. Wing to J.C. Ward, 27 Feb. 1895.

27. Ibid., J.C. Wing to Herman Bocker & Co. (New York), 26 March 1895.

28. Ibid., F.B. Gurney to Wostenholme's, 21 Feb. 1895. See also Simons Hardware Co. to J.C. Wing, 22 Feb. 1895.

29. This was one of the largest wholesale firms in the USA, commanding a powerful market position. Assuming corporate status in 1874, the paid up capital of the company was \$1 million with net assets and average monthly sales of \$1.1 million and \$400,000 respectively in 1884. See NVT18, Reference Book.

30. J.C. Wing to J.E Pilcher, 21 May 1896.

31. Wos R3, Baker & Hamilton (San Francisco) to Wostenholme's, 21 Jan. 1896. The allegations of unfair treatment were firmly denied; see J.C. Wing to Baker & Hamilton, 8 Feb. 1896.

32. Ibid., Wostenholme's to H. Wolfe & Co. (Chicago), 26 April 1895.

33. Similar complaints of extreme competitive discounting by Sheffield firms, to the detriment of quality, were made by the cutlery firm of Cooper Bros. in 1886 and 1894. See Cooper Bros, 499/B2/1, Letter Books 1883-1912, Cooper Bros. to A. Brooksbank, 1 July 1886; J. Cooper to T. Cooper, 5 May 1892.

34. Wos R3, J.C. Wing to J.C. Ward, 27 Feb. 1895. Special discounts were secretly proposed to Gurney and the Simons Hardware Co.

35. Ibid., J.C. Wing to F.B Gurney, 16 Feb. 1895.

36. The problems of the firm holding large stocks in the USA are discussed in Chapter 10.

37. "Christopher Johnson & Co.", Quality of Sheffield, (Jan. 1955), p.24.
38. SCL, Records of Christopher Johnson, MD2374, Australian Letter Book, Johnson's to W. Cowlinshaw (Melbourne), 22 Jan. 1886.
39. MD2367, Letter Book, Foreign General, Johnson's to T.O. Allamby (Madras), 16 Dec. 1880.
40. For example, the firm offered the following quantity discount to an Indian contact: 55% gross and 5% net off invoice price of £100; discount of £55 = £45 & 5% for cash = £42..15s. Ibid., Johnson's to P.P Turin (Madras), 15 Dec. 1879.
41. MD2374, Johnson's to W. Cowlinshaw, 8 Jan. 1886.
42. Ibid.
43. Ibid., Johnson's to J.W. Bundy (New Zealand Agent), 21 Oct. 1886; Johnson's to W. Cowlinshaw, 22 Jan. 1886.
44. Their plant in 1880, consisted of a warehouse, workshops and steel furnaces, rated at £274.
45. As D.C. Corner, "Financial Incentives in the Smaller Business", University of Essex Occasional Papers in Social and Economic Administration, (1967), p.1, argues, the development of contractual links with larger manufacturers is an important element in the development of the smaller firm.
46. S.H. Burrows operated an integrated iron works and rolling mills in Pothouse Lane, rated in 1880 at £666, producing steel, bar iron and forgings. They were also described as merchants, and thus the merchanting link with Johnson's would suggest the firm was using intermediaries in the exchange process.
47. MD2374, Johnson's to J.W. Bundy, 9 Sept. 1886. To avoid transaction risks, the importer was obliged to provide a bank credit note "so that no loss attaches to us."
48. Ibid.
49. Ibid., Johnson's to Cowlinshaw, 26 Feb. 1886.
50. Millman, "Price Cutting", p.33
51. MD2374, Johnson's to J.W. Bundy, 9 Sept. 1886.
52. See for example the Report of the Committee of Enquiry on Small Firms (1971), p.23. These issues were first raised in Chapter 2.
53. MD2374, Johnson's to Cowlinshaw, 25 June 1886; Johnson's to J.W Bundy, 15 July 1886.
54. E. Penrose, The Theory of the Growth of the Firm (1959), pp.217-8. As she states, the size of the firm's resource base has a "significant influence on the opportunities for expansion ... smaller firms as a group are in a different position vis-a-vis the external world from ... large firms as a group."
55. Firth's operated a large iron and steel plant, including an ordinance and file factory rated at £5,551 in 1880. Although producing heavy products, the firm also produced edge tools. Rate Books, 1880; Directory, 1880.
56. MD2374, Johnson's to J.W. Bundy, 9 Sept. 1886.
57. Millman, "Price Cutting", p.33
58. MD2374, Johnson's to W. Cowlinshaw, 25 June 1886.
59. Ibid., Johnson's to J.W. Bundy, 9 Sept. 1886.
60. Ibid., Johnson's to J.W Bundy, 23 Sept. 1886. A representative was closer to the firm's clients and as the management informed Bundy, "it is

up to you to advise, do not lose orders if the discount cannot be served all round." Johnson's to Bundy, 15 July 1886.

61. Ibid., Johnson's to J.W. Bundy, 27 Aug., 25 Nov. 1886. The reliance on quality files was a misconception; by 1900 the Sheffield file had succumbed to competition from cheap machine produced files in the USA. Tweedale, Sheffield Steel, p.160.

62. See S. Pollard, A History of Labour in Sheffield (1959), p.204.

63. PP, 1886 (c4715), 21, Second Report of the Royal Commission on the Depression of Trade and Industry, p.8.

64. T. Cannon & M. Willis, How to Buy and Sell Overseas (1986), p.17.

65. SCL, Records of Burgon and Ball, B & B69, Letter Books, Miscellaneous note, n.d.; "Burgon and Ball Limited", Quality of Sheffield, (March 1980), pp.43-5.

66. B & B68, Letter Books, Dalgety & Blackwood (Melbourne), to B & B, 30 Jan. 1872. Ward & Payne produced edge tools and sheep shears and in 1880 operated a plant rated at £439.

67. B & B68, Dalgety & Blackwood to B & B, 30 Jan. 1872.

68. Ibid., Gemell, Tucket & Co. (Melbourne) to B & B, 7 May 1871; Gibbs, Bright & Co. (Dunedin) to B & B, 24 Oct. 1872.

69. For example, the firm established a sole agency with Levy Bros. of London to sell in Australia. This was essential because marketing was expensive and time consuming. Ibid., B & B68, Levy Bros. to B & B, 17 May 1871.

70. Ibid., Mclean Bros. & Rigg to William Burgon, 5 Nov. 1869.

71. Ibid., J. Swine & Co. (Liverpool), to B & B, 1 Nov. 1871. Robert Sorby & Son produced edge tools, saws, sheep shears and steel; in 1880 they operated workshops and furnaces rated at £405, a warehouse at £48, and a grinding wheel at £15. Their shears were reported to "have nearly gone out of use owing to the bad quality." B & B68, Lorrimar, Marwood & Rose (Melbourne) to B & B, 9 Aug. 1871.

72. Ibid., Notice to the Trade on Patent Rights, 7 Feb. 1873.

73. Ibid., New Zealand Loan & Mercantile Agency (London) to B & B, 15 May; 30 June 1878.

74. B & B69, F. Robert's & Co. (London) to B & B, 26 Sept. 1878.

75. In 1878, the firm failed to deliver several orders on time to several Liverpool exporters due to a large unforeseen demand. Ibid., Thomas Bell & Co. to B & B, 4 July 1878; A. Doughty & Co. to B & B, 24 Aug. 1878.

76. B & B 70A, Letters from Fredrick to William Burgon, Fredrick (Sidney) to William, 28 Aug., 26 Aug. 1887.

77. Relations between father and son could however be strained, which indicates the problem of coordinating policy between those nearer the production end of business and those closer to the market. For example Fredrick complained that he had little notion of the quality of the steel to be sold as "you have thought fit to change the names of different qualities of steel from what you at first designated them ... your letters are ... characterised by a want of commercial and business detail." Ibid., Fredrick to William, 11 Aug. 1887.

78. Ibid., Fredrick to William, 15 April, 17 April 1887.

79. Ibid., Fredrick to Lucas & Son (Adelaide), 13 June, 25 July 1887.

80. Ibid., Fredrick to William, 10 July; 25 July 1887. By 1898, S. & D. Doncaster held 8,160 £1 preference shares out of a total of 20,000 allotted. B & B16, Minutes of B & B Ltd. 1894-1915, 13 July 1898.

81. B & B70A, Fredrick to William, 21 Dec. 1887; B & B70B, Miscellaneous Letters, Fredrick to William, 21 Dec. 1888.

82. B & B70A, Fredrick to W.H. Eyres, 4 Nov. 1898. Eyres was appointed sole travelling agent in Australia in 1890, and in 1902 was made a Colonial Director. B & B73, Agency Agreements, Agreement with W.H. Eyres and B & B, 22 April 1890; B & B16, 28 Feb. 1902.

83. B & B70A, Fredrick to William, 6 Jan. 1888.

84. Ibid.

85. Ibid., Fredrick to William, 28 Jan. 1888.

86. B & B16, 17 Oct. 1889. The competitive lead in mechanical shears was important to the firm, by 1897 US manufacturers were flooding the market with low priced, high quality goods, "made from best crucible silver steel." B & B72A, Australian Correspondence, Memorandum, 8 Sept. 1897.

87. B & B19A, Negotiations for the Purchase of J.H. Young & Co., W.H. Eyres to J.H. Young, 21 July, 23 Sept. 1903. The firm was floated as a public company, capitalised at £15,000. B & B16, 28 Jan. 1903. Burgon and Ball also developed extensive sole agency agreements in South America. See B & B74, Agency Agreements.

88. See for Example B & B73, Contractual Agreements, Agreement with Burrows & Co. (Banbury) for exclusive rights to sell portable steam engines via J.H. Young & Co., 1911; Agreement with E.H. Bartall (Heybridge) to sell petrol engines in Australia, 27 Aug. 1912. The agencies carried service crews to install and maintain machines at shearing stations and thus could be utilised for other mechanical devices. Quality of Sheffield (March 1980), p.44.

The Political Economy of Iron and Steel: Tariff Reform in Sheffield

The growing competitive constraints on Sheffield's industries are here explored in terms of the political response of the business community. This takes up the challenge of Cain and Hopkins who have called for a political economy approach to the issue of British overseas expansion up to 1914. For these authors political economy is defined as "the management of the national economy and ... the strategies devised to secure state revenues, domestic employment, and public order."¹ The emphasis here is clearly on the national economy and Cain and Hopkins integrate an historical overview of the British economy with an historical analysis of British imperialism. Thus, they raise the general hypothesis that to evaluate the expansion of British imperialism "requires prior examination of the structure and performance of the British economy and of the changing bases of political authority in the metropole." The emphasis on the structure and performance of the economy is to be welcomed, and although the analysis is centred at a national economic and political level this "does not necessarily exclude ... local evidence."²

Undoubtedly, a key area of debate from the 1880's, both in relation to national politics and sectors of industry, was the question of rising protectionist sentiment abroad.³ The crisis of the great depression alerted Sheffield's business community

to the need for a change of national policy and a greater realisation of the economic problems of a major industrial centre. That they failed to instigate major changes is not here the issue, rather, the constraints they faced became central to a view of the state which was to have important implications for the war and its aftermath. In other words, the debate over fiscal policy was to shape the perception of businessmen to the role of the state in regulating economic activity.⁴ As Alt and Chrystal claim, political economy is concerned with the expected role of government in economic life.⁵ This expected role first found expression in Sheffield in the debate over protectionism and fiscal reform before 1914.

In a letter to the Sheffield Telegraph, in 1899, the steel manufacturer Fredrick Brittain outlined the need for a political response to the issue of foreign tariffs, and pronounced that

Twenty years ago it was difficult to persuade anybody that there was any cause for anxiety, but now, fortunately for the country, serious statesmen are beginning to realise the gravity of the question, and the tone of the public press has changed.⁶

Indeed, as early as 1881, referring to the failure to renew the French commercial treaty, Brittain had claimed that the increased duties on Sheffield goods had virtually destroyed the trade in common and medium cutlery "and many important industries were seriously damaged."⁷ For Brittain, at least, the problems of increased competition and bouts of periodic depression were directly related to the maintenance of a system

of free trade in the face of "unfair" and hostile tariffs from foreign nations. As he claimed in 1885, "foreign competition, assisted by protective duties, has produced most of the misery that we see around us." In crude terms, the solution was simple, Britain should adopt a pragmatic stance to the question of trade policy instigating a system of retaliatory tariffs to protect industry from unfair treatment. This was not simply a plea to protect sectorial interests, but rather that the doctrine of free trade was being undermined by the resistance of foreign nations to provide equitable treatment.⁸

Fair trade sentiment and its association with protection was gaining ground in Sheffield from the 1880'S, and as Smith points out, "Both the steel industry and the cutlery trades were increasingly attracted by protectionist ideas which found a stronghold in the Conservative Party." In particular, Sheffield businessmen found strong political support from their parliamentary representatives, A.J. Mundella and Sir Howard Vincent.⁹ Mundella, as Minister at the Board of Trade, was in a powerful position to put forward Sheffield's view but it was mainly Vincent, through his association with the Chamber of Commerce, who was the leading advocate of protectionism for Sheffield. In a speech to the Chamber in January 1894, he urged them to take a practical stance on the issue of trade policy:

without introducing ... any matter of a controversial character of fair trade or free trade, of protection or free imports ... they must not deal with this matter from a theoretical point of view. They must adopt their legislation to the day in which they lived, and conform to

the rest of the world if they wished to hold their trade and advance their manufactures.¹⁰

The question of fair trade and protection was, however, inextricably linked to the political issues of Empire and imperial preference. The fair trade movement of the 1880's and 1890's was the forerunner of Chamberlain's tariff reform campaign, nevertheless, at the heart of both campaigns was a strong sentiment towards Empire trade and unity.¹¹ Although fair trade did not find unquestioned support from leading British politicians, "a number of Conservatives took it seriously and it could easily be worked into the mood of greater interest in the empire that was developing."¹² At the level of national political economy, these ideas were expressed through bodies such as the National Fair Trade League, founded in 1881, the Imperial Federation movement and the Colonial Conference of 1887 which all promoted plans for reforming the country's trading policy.¹³ What were the views of Sheffield's business community to these political movements and how did they relate to the business interests of the iron and steel industry? We have already referred to the efforts of Sheffield firms to forge links in Colonial markets, we now turn to the political voice behind this business strategy.

Before developing these arguments in relation to the period after 1880, it is necessary to point out that the mid-nineteenth century witnessed a growing trend amongst Sheffield manufacturers towards government involvement in trade expansion, particularly in India. According to Inkster, by 1859

the opinion of Sheffield manufacturers had "tuned in with that harmony of free trade doctrines and imperial interests that was created by the rhetoric of the Manchester school."¹⁴ In other words, governments should intervene to create an economic environment conducive to trade and manufactures. Thus, representatives of the Sheffield trades, giving evidence to the Select Committees on India of 1852-53 and 1859, argued that the government should pursue "indirect economic encouragement" providing an environment for free trade to enhance Britain's natural technological lead.¹⁵ The doctrine of free trade therefore incorporated not only the ideals of free markets and competitive advantage but also the view that governments should create markets and aid the expansion of manufacturing overseas. Thus, Sheffield businessmen, in the 1850's, saw Colonial areas as vital to the extension of markets for steel products.

In this sense, the political rhetoric of Sheffield businessmen in the 1890's was comparable to that of the 1850's. However, the rhetoric was now reinforced by a call for protectionism, Empire unity, and a conscious government effort to expand into new trade areas. This call for a more energetic response by government to new areas of trade was given a political dimension by the Chamber of Commerce in 1893. Referring to Britain's influence in West Africa, the Chamber resolved that

it was very unwise to allow large tracts of country upon which civilisation appeared to be just about to dawn to pass away from British influence, and in all probability to be closed to the free entry of British commodities.¹⁶

Cain and Hopkins have claimed that the "extension of Britain's presence overseas can be seen as an expression of her failure to dominate her chief competitors, and especially to prevent their industrialisation."¹⁷ Behind this ideal was a conscious attempt by businessmen to persuade government to defend Britain's overseas interests from annexation by her foreign rivals. Indeed, Foreman-Peck argues that British expansionary policy only changed in the 1890's as Britain's trading interests were threatened by the annexation of territory by other nations.¹⁸

The protection of trading interests, especially in Africa, was viewed by Sheffield businessmen as a matter for government intervention in the 1890's. This was partly a response to foreign infiltration into the African Continent but more importantly new areas of trade were seen as vital to the expansion of market demand in the face of rising tariff barriers. For example, in the case of Swaziland the Chamber petitioned the Board of Trade to the effect that they should resist any cessation of this territory as it was necessary to preserve "all possible markets for British products." Furthermore, they argued that British capitalists had a vested interest in this market, due to the large amount of capital invested there, and thus their interests should be protected at all costs.¹⁹ Africa was now seen as essential to Sheffield's long term interests and in the case of Uganda they informed the

Board of Trade that,

Your Council feel very strongly ... that in view of the hostile tariffs which at present so greatly impede commercial relations between this and so many foreign countries, the Government ... ought in no case to surrender its hold upon districts ... to become in the future consumers of British goods.²⁰

The question of foreign tariffs was high on the agenda of the Chamber's business throughout the 1890's. In particular, attention was focussed on the French tariff of 1892 and the McKinley tariff in the USA of 1890. Fredrick Brittain had little doubt that these tariffs were detrimental to Sheffield's trades. Referring to the French tariff, he claimed that this had "given the coup de grace to the few remaining trades that showed any signs of vitality."²¹ Indeed, even the Economist, hardly noted for its anti-free trade views, bitterly complained that

The new French tariff has only been in operation six months, and English firms in certain trades are already convinced that it is impossible to do business as hitherto, and are changing their system. Manufacturers have the alternative before them of dropping their French trade altogether, or, if it is of sufficient importance, of starting works there, and manufacturing in France.²²

The French tariff was also seen as discriminating against the higher quality steel produced by Sheffield manufacturers. The tariff in effect demarcated between common steel and fine steel for tools, the latter being subjected to a higher duty. This in itself was viewed by H.P. Marsh as an attempt to force specialist steel makers out of the French trade. However, conceding that this was inevitable, he argued that a standard based on value should be applied to steel, replacing the crude

French test, which would then set the demarcation of the tariff. This was unanimously adopted by the Chamber who urged the Board of Trade to defend the interests of the Sheffield trades. An ad valorem standard was introduced in January 1894, however there were still continual complaints that French customs were unfairly treating Sheffield steel. For example, Bedford & Sons, steel and tool producers, complained that the customs were discriminating against even the commonest steel under the lower duty.²³

Saul argues that during the last quarter of the nineteenth century the existence of "administrative protection" was a major source of complaint for British businessmen. Foreign customs practice was bureaucratic in nature, and hampered effective trade even under the umbrella of the most favoured nation clause.²⁴ The above example of French practice serves as a case in point, but was also a source of irritation to Sheffield producers in the US market. For example, in 1899 the Chamber of Commerce received numerous complaints from Jonas & Colver concerning the practice of US customs officials, who were refusing certificates of import to firms who did not certify the grade, temper and carbon content of the steel exported.²⁵

It was the issue of the US tariff, however, which created the major area of debate for Sheffield producers, given the importance of this market for the city's commerce.²⁶ The effect of the Mckinley Tariff on Wostenholme's trade was referred to

in Chapter 3. Indeed, the imposition of the tariff could alter the pattern of trade relations. As J.C. Wing argued, the firm's future profits depended largely on this market, and in view of the tariff agitation in the US the company should respond positively by shipping goods as quickly as possible, and increasing their New York stocks at the pre-tariff rates. This in turn required an extension of credit to potential importers.²⁷ Apart from increasing the costs of exchange, the imposition of the US tariff on cutlery changed the relations between the firm and their US customers. According to Edward Beckett, the effect of the tariff was to place the cost advantage in favour of low quality cutlery thus discriminating against the company's reputation for high standards. This made the firm more susceptible to cyclical fluctuations and the ad valorem duty restricted sales.²⁸ On a more general level, Saul argues that the more a specific industry was forced by tariffs to specialise on quality products, "the more susceptible it became to cyclical fluctuations."²⁹

Of equal concern to businessmen was the establishment of most favoured nation treaties by the USA in the neutral markets of Cuba and Brazil in 1891. For example, the Cuban Treaty between Spain and the USA imposed a severe cost burden on finished and semi-finished steel exported from Britain, ranging from 78% on the invoice price for sheet iron to 72% for bar iron, 70% for steel rails and 44% for cast iron.³⁰ According to the President of the Chamber, W.H. Brittain, the effect of the

treaty with Brazil was to exclude his company from entering this market, and was counter to the spirit of free trade:

the very things that the United States were to admit free from Brazil for such enormous and valuable concessions as they obtained were admitted by us free. We received no concession, but yet we had the duties against our produce enormously increased.³¹

This now brought to the fore the question of Britain's reciprocal agreements in Colonial trade. Until the 1920's, the mainstay of Britain's commercial policy was freedom in the domestic market for foreign goods and an adherence to a most favoured nation system.³² By 1893 the use of this system in Colonial trade was a major area of debate in the Sheffield Chamber. For example, in January 1893 W.C. Leng, a staunch supporter of protectionism and editor of the Conservative Sheffield Telegraph, proposed a resolution condemning the Belgian Treaty of 1862 and the German Treaty of 1865 which was carried by a majority in the Chamber. The focal point of the resolution was a condemnation of the clauses prohibiting British Colonies from admitting British goods on more favourable terms than foreign goods. Such a policy impeded "any commercial understanding between different portions of the ... Empire" and excluded the use of retaliation as a weapon to combat increased tariffs.³³

Such arguments found a political platform at both the national and local levels. For example, Vincent was prominent in the Parliamentary debate over the establishment of commercial leagues by colonial nations and his views echoed the

Chamber's concern over the most favoured nation principle. In a question to the First Lord of the Treasury, A.J. Balfour, in March 1892, he expressed his concern over the possible formation of Colonial customs unions, which would admit foreign nations on preferential terms but prohibit Britain "from entering into similar mutually advantageous trading arrangements ... by provisions in treaties made with two alien states."³⁴ Thus, Britain should respond positively to the changing tide of world trading policy. The rhetoric of Vincent, his supporters in the Chamber, and the local Tory press conformed to an ideal of fair trade; Britain should develop mechanisms based on Empire trade to retaliate against adverse tariff barriers. However, for many the line between fair trade and outright protectionism was a thin one. Vincent's stance for example was roundly condemned by opposition politicians and the local Liberal press. For his opponents his views smacked of "protectionist heresey"³⁵ of which the concept of fair trade was a mere cloaking device. But what was the view of the Sheffield business community on these issues?

It is difficult to gauge the exact numerical support for a more protectionist stance on trade issues; however, from the resolutions passed by the Sheffield Chamber there was clearly a growing support amongst businessmen for the views of the fair trade movement, and in particular the related issues of closer economic links with Empire and market expansion. For example, in 1894 the Chamber adopted the following resolution:

That the attention of Her Majesty's Government be called to the disastrous consequences that have ensued from the operations of hostile customs tariffs, and to the necessity of undertaking such measures as may ensure the defence of British Imperial interests.³⁶

However, this does not infer a united front by Sheffield businessmen on this issue. Indeed the local Liberal press, represented by the Sheffield Independent, continued to vigorously defend the maintenance of a free trade stance. Commenting upon the Agricultural Conference in London of 1893 and a meeting of the local Conservative Party in Sheffield, the paper vigorously attacked the use of protection as a remedy to the depression on the grounds that tariffs would lead to retaliatory tactics by foreign competitors. The editorial gleefully predicted "that if a certain noisy section of the Tories persist in pushing protection, however disguised, to the front, they will inevitably wreck their party."³⁷

On the business front these views were supported by Fredrick Thorpe Mappin who has been described by Smith as "one of the few leading industrialists to maintain a public identification with the Liberals."³⁸ For Mappin, free trade had provided an enormous expansion in British trade, and the effects of hostile tariffs, in particular the McKinley tariff, were viewed as temporary; the ingenuity of British businessmen would forge a new path to competitive success in foreign markets. However, this orthodox defence of free trade went further, into a direct attack on the fair trade movement as a protectionist ideology whose main aim was the defence of

sectorial interests, namely agriculture and the business interests of the steel sector. In essence then, a protectionist policy ran counter to the general national interest.³⁹

Mappin's views were clearly directed at the growing dissent of the Sheffield Chamber against the principles of free trade. Indeed, Fredrick Brittain saw it as a personal attack which had to be rigorously defended. However, Brittain's arguments reflect the difficulties of presenting a political case for fair trade outside the realms of full blown protectionism. In fact Brittain denied any political motivation claiming that "he had never been a partisan, he belonged to no association, and was neither a protectionist nor a free trader." Dismissing Mappin's "hopeful view" of trade revival he appealed to national self interest claiming that the McKinley Tariff had been detrimental to large sectors of industry. Furthermore, he appealed directly to working class interests arguing that tariffs were an indirect tax on the output of labour. On his moral high horse, he claimed that "We wanted trade. Our workmen, many of them were starving. Their trade had been stolen from them by foreign protection." Thus the crux of the argument was not directed towards the protection of sectorial interests but rather was a matter of "national self defence."⁴⁰ This essentially set the terms of the later debate concerning tariff reform and colonial preference and it is to this debate that we now turn.

The question of foreign tariffs again became a major issue

with the passing of the "stringent" Dingley Tariff in the USA in 1897.⁴¹ Now, however, the debate took on a much more political character which was exemplified in 1899 by a debate over the functions of the Chamber. In July 1899, the Chamber assumed corporate status to provide a broader democratic base for commercial debate. The liability of each member was limited to £1, the electoral procedures simplified, and provision made for various trades to have sections of their own within the Chamber. However, the new constitution contained a clause which, according to W.C. Leng, prohibited the discussion of party political issues. As Leng argued, it was not "proper that any question intimately connected with trade or commerce should be excluded on account of its being associated with political parties."⁴² Undoubtedly, the question at the top of Leng's agenda was the politically sensitive issue of tariff reform. In a reply to Leng, the Chamber's Secretary Herbert Hughes argued that the rule was to guard against encroaching on party political issues; "questions of Liberalism or Conservatism." However, with a naivety that could only be wondered at, he agreed that the tariff question would not be excluded under this rule.⁴³

The event which was to bring the question of retaliation to the forefront of political debate was a proposed increase of the German tariff in 1900. According to Buchheim, waves of hysteria against Germany reflected the penetration of markets in the 1880's, when UK exports stagnated, and the increasing

importation of German consumer goods in the 1890's.⁴⁴ However, this fails to consider the interrelated nature of Anglo-German trade, and how businessmen perceived the motives of Germany in relation to fiscal policy. In Sheffield, it was the proposed increase in the German duty on tool steel, an expanding speciality of Sheffield's industry, from 2.5 Marks per 100 kilos to 15 Marks which became the focal point of concern. According to the Chamber this "would practically mean putting an end to the steel trade with Germany." Indeed, the Chamber saw this as a direct attack on their economic interests by German steel producers who had persuaded the German Government to protect their own sectional interests.⁴⁵

Here the question of German business organisation became a central issue, in particular the power of cartels to artificially depress export prices in the face of high tariff barriers. The Chamber noted in January 1904 that some steel products were being placed on the British market by cartels at or below cost price, while the profits of the cartel was determined by the high price obtained in their domestic markets.⁴⁶ The relationship between tariffs and business combinations was also emphasised in evidence to the 1904 Tariff Commission, where it was claimed that the cause of severe German competition was protective tariffs which had stimulated production to exceed consumption "so the excess must necessarily be exported at any price, sooner than the works should stand idle."⁴⁷ While realising the difficulty of

combatting this problem, the Chamber argued that it was counter to the principles of free trade and

however profitable it may be for this or that industry to be able to avail itself of dumped goods at an unnatural price ... in the long run the natural price of the commodity is, in commerce, the safest to pay for its use.⁴⁸

The Chamber's response to the German tariff was to set up an interim sub-committee which reported in January 1901. The findings of the committee illustrate the desire of Sheffield businessmen for more positive action on the tariff question. Firstly, the sub-committee argued that an increase in the duty on bar and sheet steel, in some cases representing 50% of the value of steel, would "arouse an inimical feeling towards a reciprocal trade with Germany ... Such a duty ... is liable to destroy a trade between Sheffield manufacturers of steel and German manufacturers of tools which as grown up during the last 50 years." What was at issue here was the economic interests of Sheffield's basic steel producers who feared a reduction in the supply of steel to German tool fabricators, centred on the regions of Remscheid and Solingen who were "large exporters of tools."⁴⁹ Secondly, the committee questioned the economic rationality of the Germans, arguing that if the tariff was imposed to combat US steel imports into Germany then it "should only be applied to those countries who impose a similar tariff against German iron and steel." Thus retaliation was recognised as a legitimate commercial weapon, and it therefore logically followed that thirdly, as Britain allowed large quantities of

German iron and steel to enter free of duty any increase in the tariff would strengthen the case for a retaliatory tariff on German exports.⁵⁰

The hysteria generated by the German proposals was clearly related to the downturn of trade towards the end of 1900. In this environment, an effective response to commercial policy was deemed essential.⁵¹ Indeed, the question of party politics could no longer be ignored and this view was forcefully portrayed by the Tory member for Sheffield Hallam, Stuart Wortley. In relation to the German tariff, he urged the Chamber that the "proposed German crusade against British manufacturers will be deterred only by consideration of purely German interests." Thus, according to Wortley, the German interest was best served by avoiding retaliation against German exports and therefore a tariff would provide a powerful weapon to British businessmen. For Wortley, this was now a party issue and he argued that the political interests of businessmen were inextricably linked to that of the working class electorate.⁵²

To reinforce these arguments, Wortley alluded to the reaction of the USA to the threatened German tariff. He had little doubt that the USA would retaliate but warned that "The parting of the ways would come if, and when, by such a threat the United States had secured for themselves a separate arrangement with Germany." Such a response would reinforce the already "formidable prospect" of growing US competition in iron and steel, and reduce Sheffield's competitive position. The

crux of the argument was therefore that the threat of retaliation was essential to effective trade negotiations and, in relation to the US challenge, he claimed that "If we are to believe our American friends ... their enterprising methods and gigantic combinations are going to annex the commercial world. I doubt whether British skill and enterprise are going to capitulate so easily."⁵³ The use of a tariff as a retaliatory mechanism found widespread support from leading Sheffield businessmen. For example, C.W Kayser, the managing director of the steel firm of Kayser, Ellison & Co., called for political agitation on the issue of retaliation and this was supported by the Chamber's President W.F. Beardshaw. In fact, Beardshaw took the argument further, claiming that if the German tariff came to a head it would induce the Colonies to give preferential treatment to British trade.⁵⁴

The German tariff was thus clearly viewed as an attempt to stifle Sheffield's trade in basic and semi-finished steel. Indeed, the bulk of steel imports into Britain before 1913 were of a semi-manufactured form to be fabricated in the UK.⁵⁵ For example, in 1911-13 Britain imported on average 524,000 tons of semi-finished steel from Germany and 159,000 tons from the USA, compared to 412,000 tons and 64,000 tons respectively for finished steel.⁵⁶ However, for Sheffield the development of high grades of steel for the production of tools was an expanding area of business, and for a particular sector of the business community the German tariff was a flagrant attack on

their economic interests. One could even argue that the export of tool steel was against the long-run interests of Sheffield tool fabricators who faced growing competition from the emerging industries in Germany and the USA. As early as 1885 Fredrick Brittain had argued that the bulk of semi-manufactured steels were exported to countries within Europe "where they are finished and in many cases compete with articles entirely made in England."⁵⁷ Thus the export of semi-processed materials augmented the expansion of foreign industry to the detriment of Sheffield fabricators. Such arguments were to have a strong influence on producers of tools when the details of the German tariff were finally announced in August 1901.

To the surprise of the Chamber, the new tariff proposed no increase on tool steel, but rather a considerable increase in the duty on fabricated steel such as files, saws, sickles, and a variety of other Sheffield products. This brought forth a barrage of protest from Sheffield manufacturers and led Charles Belk and W. Beckett to propose an immediate letter of protest to the Foreign Office.⁵⁸ The Chamber's Tariff Committee had little doubt that the effect of the changes was to raise the tariff from a protective to a prohibitive tax on finished steel.⁵⁹ Moreover, the tariff was highly specific in construction, effecting various Sheffield products. For example an increased duty was placed on small files whilst the duty on large files, which were seldom imported into Germany from Sheffield, was decreased. Furthermore, specific duties were

imposed on scissors and knives and on small sizes of steel bars of less than 1 kilogram in weight "of which the Sheffield manufacturers have made a speciality and upon which the cost of production is already high."⁶⁰

For Sheffield producers this was viewed as blatant commercial aggression on the part of Germany, based on a spurious economic rationale. For example, in the case of files the Tariff Committee argued that the increased duty on small files was intended to "destroy" a trade in which Germany already held a significant competitive lead: "for several successive years ... contracts for files have been taken by Remscheid manufacturers in neutral markets at 20% cheaper rates than the cost of manufacturing similar files in Sheffield." Similarly, in the case of scissors and knives, they argued that the free importation of these goods into Britain "is permitted, and larger quantities of German scissors and knives are imported into England than are exported to Germany from Sheffield."⁶¹ Indeed, similar points were made by H. Spear, the London agent of Beardshaw's in relation to US competition in saw and engineering files, which were being sold for 65% and 5% and 67½% off Sheffield lists.⁶²

There was clearly now a case for government protection, and the Tariff Committee condemned the Board of Trade for inaction in the face of the German penetration of British markets, and claimed that "well known German manufacturers through their agents in London sell larger quantities of steel

sheets and other articles than the whole Sheffield trade combined, these articles are all admitted free ... whilst the new tariff will effectively prevent reciprocal trade." Thus tariffs were opposed to an "open door policy" in the face of Sheffield's efforts to "contain" German competition, and the committee recommended that the Board of Trade should not enter a new commercial treaty and not accept the new tariff structure.⁶³

This plea to the Board of Trade, to defend the interests of businessmen, had earlier been applied to issues such as the protection of trade marks abroad and the establishment of a commercial intelligence department to provide information to British business. The false use of Sheffield's trade marks abroad, particularly by German producers, was a major area of concern to the trade from the 1850's and continued to occupy a great deal of the Chamber's business from the 1880's.⁶⁴ The Chamber had been influential in the passing of the Merchandise Mark Act of 1887 but the continuation of false marking and the legal costs involved in prosecution remained a major problem for the Sheffield trades. In 1892, the Chamber called for a common international trade mark and government assistance to meet legal costs.⁶⁵ Under the guidance of the Chamber and the Cutlers company a number of large Sheffield cutlery firms took legal action against German firms for fraudulent marking⁶⁶. however, a direct appeal to the Government by the Cutlers Company for financial assistance fell on deaf ears. For the

Master Cutler, F.C. Wild, there was now a clear case for government intervention to protect Sheffield's name abroad.⁶⁷

Attached to the trade mark issue was the agitation for the formation of a commercial intelligence department, to mediate in foreign trade disputes and to provide commercial agents in key centres to report upon the extent and progress of Sheffield trade "and the opportunities of developing British interests." The formation of this new government department in 1899 was welcomed by the Chamber as a major innovation in the promotion of trade and "the collection and speedy dissemination of commercial intelligence." However, by 1902 Vincent could argue that the intervention of government to promote trade should be reinforced by a commercial action department, to defend industry against foreign tariffs and "look ahead for the commerce of England."⁶⁸

The preceding analysis of Sheffield's political economy indicates a growing movement towards a policy of retaliation to combat rising foreign competition under a tariff umbrella. In this sense, the response of the business community contained large doses of pragmatic self interest, tariffs were utilised as a catchword to explain competitive decline and the periodic bouts of recession which disrupted the Sheffield trades in this period. However, it does not indicate a more positive move towards radical fiscal reform as outlined by the proposals of Chamberlain in 1903. Indeed, Marrison claims that business organisations followed a cautious approach to the question; the

complex nature of the tariff reform debate was "a political as much as an economic question." It was an unwelcome fact for many businessmen "that their own position had become a primary issue of party conflict," and "the very word protection invoked contempt." Furthermore, divisions within the Unionist ranks and the confusion and uncertainty of Chamberlain's proposals hardly provided a concrete platform on which businessmen could formulate a decisive policy on the tariff question.⁶⁹ As Lloyd-George remarked, at the height of the tariff debate in May 1903, "I do not think any Honourable Member has the slightest conception of what the policy of the Government is."⁷⁰

This was equally true of the business debate in the Chamber of Commerce.⁷¹ Although the Independent could claim that "There are some interesting cross-currents in motion (which) will unite in an appeal to the country on the question of an Imperial protectionist union",⁷² the policy debate in the Chamber highlights the difficulties of formulating and presenting a united front. Indeed, at a meeting of the Chamber in March 1904, to formulate a resolution to the Associated Chambers of Commerce, the members were faced with three contradictory resolutions from the London, Dublin and Nottingham Chambers. All three proposals varied in their intensity of action. For example, the London resolution proposed an ad hoc retaliatory tariff controlled and sanctioned by government; the Dublin resolution proposed a fact-finding Royal Commission to obtain information on the effects of fiscal

reform; the Nottingham resolution went further advocating Balfour's policy of using retaliation in defence of domestic industry's faced with hostile tariffs.⁷³ The discussion on these resolutions highlights the complex nature of the tariff reform question for British businessmen.

For representatives of the cutlery trades, such as Sir John Bingham of Walker & Hall, the Nottingham resolution with its obvious protectionist overtones provided a solution to the industries competitive decline. However, he argued for an amendment to the resolution claiming that governments should utilise tariffs as a bargaining counter. This was to be implemented through closer economic links with the self-governing colonies, based on a policy of preferences. However this found little support from A.J. Hobson who argued that neither resolution was framed as to provide a direct and sound economic rationale for a change in fiscal policy. Referring to the London resolution, he claimed that "It seemed to ... have been drawn up by Free Traders who wished to advocate free trade but were not quite frank enough to do so", while the Nottingham resolution was seen as a means of arriving at the "haven of protection" through retaliation.⁷⁴ Hobson's views are interesting as they set out the framework of the debate concerning the question of tariff reform within the Chamberlain proposals, and also set out the anti-tariff stance within the Chamber.⁷⁵

Firstly, Hobson argued that the resolutions contained no

reference to Colonial preference which was the mainstay of Chamberlain's proposals.⁷⁶ The Birmingham speech of May 1903,⁷⁷ did not so much advocate preference but rather urged political discussion, a "great inquiry" into the fiscal policy of the British nation. The economic measures at the centre of the campaign awaited his Glasgow speech of October 1903. However, it was now only too obvious to the supporters of free trade that Colonial preference involved the taxation not only of food imports but also raw materials.⁷⁸ This point was hammered home by Sir Charles Dilke, the Liberal MP for Gloucester, in May 1903, who for good measure also included semi-manufactured goods to the list of taxable imports.⁷⁹ For Hobson this had now become the crux of the debate and as he argued,

the original departure that has led to the raising of the whole question ... contained in ... Chamberlain's speech at Glasgow, admittedly needed taxation of food in this country to carry it out with success, and every day that the controversy went on we were getting further from the original issue and nearer to the advocacy of courses that meant pure protection.⁸⁰

Thus, for Hobson the debate was now taking on a much wider meaning, and the original conception of Imperial unity was being manipulated into a policy of straight forward protectionism under the political disguise of retaliation.⁸¹

This of course diverted the debate away from policy objectives and focussed discussion on the means and implications of a preferential tariff structure. For Hobson, the obvious effect of taxing foreign food imports was an

increase in real wages, which as he argued would effect the cost structure of industry and reduce the ability to compete.⁸² This obviously had implications for Sheffield producers who were acutely aware of the cheap labour of German competitors. Furthermore, in support of Hobson, the steel and tool manufacturer, S.E. Howell, referred to the benefits of free trade in securing cheap imports of raw materials and semi-finished goods. Using steel billets as an example, he claimed that "The cheaper they could be bought the greater was the capacity of English manufacturers to compete in neutral markets."⁸³ This defence of free trade mirrored the comments of the Economist in July 1903 which claimed that British steel manufacturers had imported billets, girders and various descriptions of manufactured steel from abroad because prices were lower than could be offered by UK producers. Although this competition had been severely felt by British steel manufacturers it had benefited consumers by dampening prices, due to competition, and by enabling firms to produce more cheaply, thus increasing consumption. Furthermore, on the question of food imports, the Economist claimed that a tax would have detrimental results to the steel industry whose methods of production were highly labour intensive.⁸⁴

Secondly, the issue of Colonial preference was condemned as a back door route to protection. For Hobson, the very notion of a preference signalled a call for tariffs to be imposed on neutral trading nations which smacked of protectionism.⁸⁵

Furthermore, he quoted the views of Robert Giffin to the effect that "the chief obstacle to the federation of the British Empire was not the free trade of the home country, but the protectionist notions of our self governing Colonies."⁸⁶ Indeed, the political problems of introducing a preferential tariff had been a stumbling block for the Chamber in the 1890's. For example, in a heated debate in the Chamber in 1892, concerning a pro-federation speech by Alexandra McNeil, a member of the Canadian Parliament, little agreement could be found on how this was to be achieved. This led W.H. Brittain to propose that no action should at present be taken over the question of preferential treatment "whatever difference of opinion might exist among them."⁸⁷

Thus the political problem of negotiating preferential agreements was a powerful argument to the free trade group. As H.H. Bedford claimed in 1905, even with a preferential duty of 33&1/3% Sheffield cutlery manufacturers were unable to sell in the Canadian market as duties were still too high and Canada did not really "encourage inter-trading."⁸⁸ Furthermore, Beardshaw's encountered fierce competition in the South African market, and they noted that orders were being placed with US tool producers "on account of the cheaper price; this is a new departure."⁸⁹ In fact, the Economist in 1904 attacked Chamberlain's scheme, claiming that there was no political guarantee of preferences and even when granted "the duties levied on staple British products are ... of a very substantial

nature."⁹⁰

Thirdly, the argument turned to the question of retaliation and the possibility of commercial wars. In particular, Hobson pointed to the importance of shipping and the detrimental effect of tariffs on commercial interaction. In conclusion, he argued that free trade was the most advantageous policy for the country to follow, it provided opportunities for the employment of labour and capital "and it would be a very great sacrifice ... to sacrifice the open markets of this country, the freest and cheapest in the world."⁹¹ Hobson's defence of free trade clearly put the onus back on the tariff group to justify their arguments. The defence for tariffs was put forward by a number of Sheffield businessmen and was summed up by Beardshaw: "The country might gain temporarily by cheap dumped material, but it was building up a business on a false foundation."⁹² This of course was again no more than an appeal to sectional interests and the formation of a national policy relating to all sectors of trade and industry was clearly missing from the pro-tariff view. Nevertheless, a resolution was passed by a majority of 27 to 19 supporting a retaliatory tariff and Colonial preferences.

Appendix D, Table 1, provides a breakdown of the above voting pattern, and Table 2 shows the membership of the local Tariff Reform League in 1904. Although it only represents a small cross-section of Sheffield businessmen it indicates that there was support for tariffs across a wide range of

Sheffield's trades, finding support from cutlery, steel, and tool producers. As Marrison claims, an hypothesis based on economic determinism is too simplistic, "Foreign competition ... was felt unevenly, not only between different branches of the same industry, but also between different firms within the same branch."⁹³ However, a survey in 1904-1905 by the Chamber showed a widespread, if variant, support for tariff reform. The inquiry was claimed to be "representative of the large and small manufacturing firms in Sheffield", and there was a 3:1 majority, of those firms who responded, in favour of retaliation. However, the "substantial minority" clearly indicated a continuing diversity of opinion. For example, numerous firms claimed that tariffs excluded their products from foreign markets, but largely for lower quality goods, and specialist steel firms could still compete on the basis of quality. Furthermore, there was considerable confusion in the returns concerning preferences, with firms evenly split on the issue of high colonial duties and their effects on trade. Indeed, no consensus could be found on what the exact level of preference should be.⁹⁴

Politically, Sheffield businessmen displayed a confused response to the issue of tariff reform. The free trade group within the Chamber put up a sophisticated defence of the doctrine which was hardly matched by the economic rhetoric of their opponents. No unified and coherent policy is evident in Sheffield before 1914, although a majority of businessmen were

moving to a pro-tariff position, which called for government to intervene to protect key industrial interests. Whatever the disagreements, one thing they all accepted was the need for an effective response to competition by British businessmen. As Pollard argues, there was the possibility of another response, outside of tariff reform, involving the development of business organisation, increased mechanisation, and an enhancement of technical education.⁹⁵ As Batty Langley argued in 1906, "it was no good ... craving assistance from Parliament to save ourselves."⁹⁶ This takes us back to the question of resource development, which was to be intensified during the War years, however, the question of protection was to re-emerge as a response to anti-German sentiment and the depression of the 1920's.

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4. See Chapter 10.
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6. Telegraph, 15 Feb. 1899.
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8. F. Brittain, Sham Free Trade: What it has Done for England (1885), pp.4-5.
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12. T.O. Lloyd, The British Empire 1558-1983 (1984), p.228.
13. J.C. Wood, British Economists and the Empire (1983), p.29.
14. I. Inkster, "The Manchester School in Yorkshire: Economic Relations Between India and Sheffield in the Mid-Nineteenth Century", Indian Econ. & Soc. Rev., vol.23, no.3 (1986), p.319.
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19. SCCM, LD1986(4), 30 Jan. 1893.
20. Ibid. See also 18 Dec. 1894. A clear emphasis was placed on Imperial economic defence, which included the use of force. See their support for armed intervention in Mashonland and Matabeleland in defence of the Chartered Co. of S. Africa, which "struck a blow in the interests of the commerce of the Empire." 30 Jan. 1894.
21. Telegraph, 3 Feb. 1899.
22. Economist, 3 Aug. 1892. The possibility of setting up overseas subsidiaries in France, to circumvent the tariff was a possible alternative. See SCL, Records of Allen's, Aurora 541(b), Loose Letters, R. Woodward to W.E. Allen, 2 March 1908, a proposal from Tropenus of France to set up a plant for the production of tramway material, in the face of high tariffs and the preference for French manufacturers by local municipal authorities.
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24. S.B. Saul, Studies in British Overseas Trade (1960), p.136.
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28. Wos R12(e), E. Beckett, Journey Reports, Beckett to Wostenholme's, 23 June 1893.
29. Saul, Overseas Trade, p.165.
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32. Saul, Overseas Trade, p.135; Capie, Depression, p.61. Britain still attempted to enforce the most favoured nation principle even after the General Tariff of 1932. Capie, Depression, p.132.
33. SCCM, LD1986(4), 30 Jan. 1893.

34. Hansard Parliamentary Debates, 4'th Series, vol.15, 29 March 1892.
35. Ibid., vol.17, 3 Feb. 1893; Independent, 4 Jan. 1893.
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37. Independent, 4 Jan. 1893.
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39. Independent, 31 Jan. 1894.
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43. Ibid. Earlier, in 1893, Batty Langley had argued that "It was difficult ... to say where commerce ended and politics began." Telegraph, 31 Jan. 1893.
44. C. Buchheim, "Aspects of Anglo-German Trade Rivalry Reconsidered", Jnl. of European Econ. Hist., vol.10, no.2 (1981), p.289.
45. Independent, 21 July 1899; SCCM LD1986(5), 7 Nov. 1900.
46. SCCM, LD1986(5), 29 Jan. 1904.
47. See Economist, 30 July 1904.
48. SCCM, LD1986(5), 9 Jan. 1901. Amongst the most vocal objectors to the tariff was the large steel firm of Seebohm & Dieckstahl. See Ibid., 22 Nov. 1900.
49. Ibid., 9 Jan. 1900.
50. Ibid.
51. Trade received a "severe check" towards the end of 1900, due to the high price of fuel which pushed up relative production costs. Thus the German Tariff was viewed with considerable alarm by businessmen already facing resource pressures. Ibid., 30 Jan. 1901. See also Buchheim, "Anglo-German Trade", p.282, who notes the cyclical nature of anti-German sentiment.
52. Telegraph, 31 Jan. 1901. As Wortley argued, "Demands for retaliation must ... come from the mass of the workers" whose interests as "producers" was best served by protecting employment and "Such a demand, if it comes, will be too strong to be engineered by Fair Trade Societies, or restrained by Cobden Clubs."
53. Ibid.
54. Ibid.
55. T.H. Burnham & G.O. Hoskins, Iron and Steel in Britain 1870-1930 (1943), pp.42, 326. S. Pollard, Britain's Prime and Britain's Decline (1989), pp.30-1. As the Economist, 11 July 1903, noted, "For some years past there has been a steady and continuous growth in the imports ... of pig iron, steel billets, girders, and various descriptions of manufactured iron and steel."
56. Pollard, Britain's Prime, p.31.
57. Brittain, Sham Free Trade, p.8.
58. SCCM, LD1986(5), 22 Aug. 1901.
59. Ibid., 26 Sept. 1901.
60. Ibid.
61. Ibid. Sheffield was also facing competition in neutral markets. See

- Ironmonger, vol.30, 12 May 1903, who referred to the German practice of offering knives at 20% under quoted prices.
62. SCL, Records of Beardshaw's, MD7081(5), Minute Book, H. Spear, Report, 18 June 1902. These figures relate to discounts off standard price lists, the 5% being the cash discount.
63. SCCM, LD1986(5), 26 Sept. 1901.
64. See P.P. 1886 (c4714), 21 Second Report of the Royal Commission on the Depression of Trade and Industry, pp.10-11, 20, 80, 88-9. Also, SCL, Borough of Sheffield, Minutes of the Council, 8 April 1885, Letter from the Cutlers Co. re the false marking of goods by Germany.
65. SCCM, LD1986(4), 24 Nov., 22 Dec. 1892.
66. See criminal proceedings against a Solingen manufacturer by Joseph Rodgers, who admitted that false marking was common; complaints of Wheatley Bros. against German scissor producers; views of Seebohm & Dieckstahl against German falsification in China. SCCM, LD1986(5), 7 Nov. 1900; 23 Oct. 1902. False marking was acute in Colonial markets. See, Ironmonger, 23 March 1907, exporting of German cutlery to England which was then re-exported to Canada under the Sheffield name.
67. SCCM, LD1986(5), 29 June 1899. In 1899, 17 firms subscribed to a fund to provide legal costs.
68. Ibid., 29 June 1899, 25 Jan. 1900, Independent, 1 Feb. 1902.
69. A.J. Marrison, "Businessmen, Industries and Tariff Reform in Great Britain 1903-1930", Bus. Hist., vol.25, no.2 (1983), pp.163-4.
70. Hansard, vol.123, 28 May 1903.
71. As Beardshaw claimed, the Chamber remained committed to free trade although it had "ceased to be an ... idol which might not be touched or tampered with ... moderately." Independent, 15 Dec. 1902.
72. Independent, 18 May 1903.
73. Ibid., 5 March 1904. Balfour's views were expressed in his defence of Chamberlain in Hansard, vol.123, 28 May 1903: "We ... have to look forward in future to a condition ... in which more and more there will be a wall of hostile tariffs built up against us ... foreign nations will increasingly manipulate their own tariffs to our disadvantage, and we shall be less and less ... able to find ... a market for our manufactured goods."
74. Independent, 5 March 1904.
75. Hobson, through his business contacts, represented a wide section of Sheffield trades; see Chapter 4.
76. Independent, 5 March 1904.
77. The Times, 16 May 1903.
78. A.J. Marrison, "The Development of a Tariff Reform Policy During Joseph Chamberlains First Campaign, May 1903 - Feb. 1904", in W.H. Chaloner & B.M. Ratcliffe (eds), Trade and Transport (1977), p.214.
79. Hansard, 28 May 1903.
80. Independent, 5 March 1904.
81. Chamberlain's campaign gradually evolved from a plea for Imperial unity "to a more broadly based demand for protection and preference." P. Cain, "Political Economy in Edwardian England: The Tariff Reform Controversy", in A. O'Day (ed), The Edwardian Age (1979), p.4.
82. Independent, 5 March 1904.
83. Telegraph, 5 March 1904.
84. Economist, 11 July 1903.

85. As Marshall noted in 1907, for the UK preferences were a move towards protection, but for the Colonies it was a move away, as "their present tariffs are highly protectionist." Cited in Wood, British Economists, p.129.

86. Independent, 5 March 1904. Giffin retained his adherence to free trade, pointing out the difficulties of reconciling free trade with Imperial unity, although he had been Secretary to Chamberlain at the Board of Trade. Wood, British Economists, pp.161-73.

87. Telegraph, 26 Oct. 1892.

88. MD7081(5), H. Spear, Report, 20 April 1899.

89. Telegraph, 29 June 1905. See the views of C.O. Ballantyne, Canadian Manufacturers Assoc., who claimed the volume of Sheffield cutlery had declined from 65%-61%, although the USA suffered a 50% higher duty and Germany double.

90. Economist, 19 Nov. 1904. As the Economist noted, the higher duties on cutlery in the white dominions, as against tools, showed a clear preference for protecting infant industry.

91. Independent, 5 March 1904. See also views of Alderman W.J. Clegg, S.E. Howell, Sir Charles Skelton, who supported Hobson. Telegraph, 5 March 1904.

92. Telegraph, 5 March 1904.

93. Marrison, "Businessmen", p.157.

94. SCCM, LD1986(6), 27 Jan. 1905.

95. Pollard, Britain's Decline, p.243.

96. Independent, 3 Feb. 1906. For Langley, "Assistance would only come from educational advantages and a realistic grip of trading necessities, combined with more work."

War and Business Development: Sheffield 1914-1920.

Hannah claims that there remains a consensus of opinion that "In the United Kingdom the First World War marked a watershed in economic and business development as well as in political and social life."¹ The emphasis on the political as well as economic is to be welcomed and in particular the changing relationship between the state and business, during and after the First World War, has been a focal point for economic, political and social historians.² Government control over key industrial sectors during the war and the de-regulation of economic life after 1919 has been constantly emphasised. In turn, government was now in a "unique position to influence business firms" and direct them towards more efficient methods of production and organisation, and there was now a growing tendency towards business cooperation "which questioned the virtues of competition."³ This chapter will focus on the changing pattern of production in Sheffield's industry which was vital for Britain's war time needs.⁴ This required both a dynamic response by business to changes in the human and physical resource base of firms, and in structural changes related to increased business concentration. Furthermore, the development of business cooperation, both formal and informal, was a major development of this period.⁵

In earlier chapters, the tendency towards the increasing scale of operations, and the introduction of rational production methods combined with scientific research, has been

noted in the area of specialist steel production, at least in the larger business firms. Furthermore, the heavy engineering sector expanded rapidly under the impetus of government demand prior to 1914. For example, in 1913 Admiralty orders were "overflowing" and firms had orders in hand for Spain and France as well as home demand. In consequence, "Several Sheffield manufacturers have recently had to increase their works and plant" and "The export trade generally has reached a very high level, all classes of steel, twist drills, milling cutters and machinery ... being shipped."⁶ However, the pre-War boom in trade could easily outrun the ability of firms to increase their productive capacity. Commenting on trade in the first half of 1913, the Chamber of Commerce noted a record volume of output but demand had "exceeded the means of production to such an extent that execution of orders fell seriously in arrears and remained in that unsatisfactory condition for a long period."⁷

An obvious constraint on expansion was the deteriorating relations between capital and labour in the period 1911 to 1914, which was noted in Chapter 4. This would suggest a closer symbiosis between Sheffield businessmen in the years leading up to 1914 and the demands of war were to reinforce cooperation, not only in terms of labour control, but also in the area of technical and business interconnections. In 1916, William Ripper, a Sheffield engineer, claimed that employers had now perceived the value of cooperation as a means of maximising

output and although

The war is not the explanation of the highly organised methods to be found in the large works ... it does explain the rapid spread of the desire among employers, large and small, to associate and co-operate for the common good of the industry ... instead of competing in the world markets, not only against foreign competition, but against one another.⁸

Thus, the needs of war demanded reorganisation and this in turn depended on the interaction of firms to overcome constraints on production.

The war intensified the pressures on firms' physical and human resources and also disrupted normal market outlets. This therefore demanded a positive response by business to overcome constraints on both the demand and supply side of operations. On the demand side, the war disrupted trade in world markets which severely hit firms geared towards producing for export. Given the central importance of Europe in trade before 1914, economic relations were severely disrupted as business and bankers lost confidence in European currencies as a medium of exchange, and later naval blockades and submarine warfare further disturbed trade.⁹ The disruption of trade was especially acute for firms who relied heavily on trade with the belligerent nations where the imposition of exchange controls and the general disruption of trade could force firms to the point of bankruptcy.

For example, John Kenyon & Co had established extensive contacts in Russia before 1914 for the sale of tools and steel, and by 1914 this market accounted for 80-90% of the company's

business. The war was to disrupt this trade severely, and the company's financial assets were substantially reduced as a consequence of the firm's large liabilities of 400,000 Roubles in Russia at the outbreak of war. Failure to retrieve this debt forced the firm to seek financial assistance from the Midland Bank who deposited the Roubles with a Petrograd bank on the company's behalf. However, the locking-up of these assets and the depreciation of the Rouble led to serious financial losses, compelling the directors to negotiate financial help from the Midland Bank, "pending the duration of the war or until such time as the rate of exchange becomes more favourable." In 1915, £9908 was written off out of profits to cover the loss, and with the breakdown of trade with Russia and the collapse of the Rouble in 1917 a further £21,104.¹⁰

This of course was an extreme example, although other firms such as Spear & Jackson suffered disruptions to their trading links in the European and South American markets, entailing a loss due to falling exchange rates and the suspension of payments.¹¹ Furthermore, government regulations on exports deemed essential to the war effort, under licences from the Board of Trade, provided further disruptions in market exchange. Although the Sheffield Chamber supported government action in this area as early as August 1914, a number of firms continued to complain that the embargo affected the export of non-essential products. For example, in 1914 four Sheffield cutlery and tool producers complained bitterly over the embargo

on carpenters' and joiners' tools,¹² and the Government proclamation of July 1915 restricting the export of steel and tools, containing valuable tungsten or vanadium, was condemned by Edgar Allen's who were producing steel with low proportions of tungsten for export markets.¹³

However, the loss of these markets was more than compensated for by a substantial increase in demand for the war effort. As the Economist noted in 1917, in Sheffield "The supplying of war requirements completely dominates the trade situation."¹⁴ The pressures of war demand had become apparent to Sheffield firms in 1915, when the demand for products was "larger than anticipated", and had provided work for firms not formerly engaged in these lines. This indicates that firms were now geared towards switching to war production, but the Chamber noted that although government contracts had provided a substantial part of the boom, a large amount of ordinary work was being undertaken which had formerly been executed in Germany, and with the suspension of the German cutlery trades there was a flood of orders from the USA.¹⁵ However, this was now to put pressure on the supply side of operations, and although firms had intensified operations by instigating night work, they were operating under "the highest pressures"; local resources were inadequate to meet demand and "employment could be found for more plant and men."¹⁶

The pressures on the firm's resource base is excellently illustrated by the example of the steel and tool producing

business of Spear & Jackson which became a controlled establishment under the Munitions of War Act of 1915. The firm quickly adapted to war production,¹⁷ but during 1915 the management noted the "extraordinary" demands on plant and equipment, and the works "have been pushed all the way ... to cope with the demand for munitions."¹⁸ A description of the firm's operations illustrates this point:

Our mill and forge which ordinarily run both day and night have been pushed to the extreme during 1915 to supply the government's demands for bullet proof shields, armoured plates, high speed steel, etc., and in connection our hardening plant and furnaces have had to work day and night shifts to treat and harden the plates.¹⁹

The ability of Spear & Jackson to rapidly adapt highlights the flexibility of firms both in terms of the physical switch to war products and the implementation of new work routines. For example, under directions from the Ministry of Munitions the firm's agricultural and garden tools departments were converted to producing entrenching shovels, gas engines and electric power installed, and a double shift system implemented in 1915. Similarly, the hardening and heat treatment plant was geared exclusively to armoured plate manufacture for four months in 1915 with machinery working at double time.²⁰ The increased intensity of operations is supported by statistical evidence on the hours of work of employees and the running times of engines and machinery, which is shown in Appendix E, Tables 1-3. This clearly shows the increased intensity of work and indicates that management could meet periods of exceptional demand by intensifying the

operations of both its physical and human resources. This was achieved by running the machinery at night and on Sundays, and the introduction of overtime for both males and the growing female workforce. For example, to meet government requirements in March 1916, overtime hours were increased and female workers placed on night work.²¹ (Appendix E, Table 1).

The introduction of women to the work of the metals industries was accompanied by the employment of unskilled or semi-skilled workers owing to severe shortages of manpower caused by voluntary enlistment.²² As the management of Spear & Jackson noted, "owing to enlistment ... a considerable number of changes were made and skilled workpeople employed on machines replaced by others."²³ In fact, the human demands of war left a severe shortage of both skilled and unskilled labour. For example, W.F. Beardshaw informed his directors of the necessity of making a general advance in wages owing to the scarcity of both unskilled and skilled employees "with a view to ensure continuity of work."²⁴ The process of de-skilling has been referred to by Pollard as "dilution" and was implemented by a number of employer-union agreements in Sheffield's munition and engineering trades from 1915.²⁵

This process of de-skilling, combined with the increased intensity of work, would seem to indicate a process of intensive not extensive growth.²⁶ That is, firms attempted to intensify the workload of existing workers and machines faced with imbalances in the supply of skilled labour. For example,

the workforce of Spear & Jacksons declined by 20.1% between 1912 and 1915 although the increased work effort resulted in an increase in production. As Appendix E, Tables 4-5 show, by 1915 the production of steel shovels had increased by 56.8% over the standard output for 1912-13, and the production of high speed steel rose from a mere 5 tons in 1912 to 314 tons by 1916 as they switched from less specialist alloy steels.²⁷

A major development in special steels was the adoption of electric steel melting, first introduced by Edgar Allen's in 1910 and followed by Firth's and Jessop's in 1911. Before 1914, the process was still too costly for most producers to compete, where quantity was the chief requirement, however, the demand for special castings during the war gave an enormous impetus to the electric steel industry, and its advantages in producing high grade steel ensured it was adopted by a number of Sheffield firms.²⁸ In 1915, Spear & Jackson extended their steel plant, installing a new electric steel and melting department which began production in June 1916.²⁹ The decision to invest in this process was to meet increased orders for high grade steel and as the management remarked, "for high speed steel and files we are booked up for months ahead."³⁰ However, growth through intensification was not without its drawbacks. Intensification entailed increased wear and tear on plant and machinery and thus increased the capital costs of operations. The plant was operated both night and day and Sundays entailing excessive depreciation costs, and in a letter to the Inland

Revenue, concerning a request to increase the allowance for depreciation to 12½% (£3258), under the excess profit duty, the management noted the effects of intensified production:

we are fully of opinion the allowance on such plant should and will eventually be greatly increased when your department becomes more acquainted with what is, at present, a new industry ... the melting of steel by the electric process ... Electric furnaces are delicate and complicated machinery with a very short lived prospect.³¹

This demand for increased allowances was based on a number of arguments related to intensified working. Apart from the obvious wear and tear this involved, given the production of heavier work than ordinary lines and "more machines in action", the management pointed to the inability to make repairs due to a deficiency in the supply of trained mechanics, and the pressures of work which would have stopped other processes of production. Furthermore, they argued that the introduction of semi-skilled operatives on machinery in 1915 had an "adverse effect" on the machines, and "a large proportion of our machines will need to be practically rebuilt or scrapped."³² In fact it is likely that the requirements of skilled labour on machinery restricted the firm's efforts to introduce unskilled operatives. For example, the ratio of unskilled to skilled labour working on machinery in 1915 was 1:3.5 (Appendix E, Table 6).

Furthermore, the increased demand for fuel and increases in wages tended to push up unit costs. In terms of fuel consumption, firms could invest in new and more modern equipment to effect economies in fuel use. For example,

Beardshaw's in 1917 installed a new electric generating plant and steam plant to economise on fuel consumption and replaced its rolling mill engine, which had been installed as early as 1858, with a new electric driven engine.³³ Economy was now at the forefront of managerial decision making in relation to fuel consumption. Spear & Jackson in late 1914 installed two new Babcock boilers "and thereafter a considerable economy of coal was effected."³⁴ The rapid substitution of more economic forms of power such as gas and electricity was clearly evident in Sheffield, the consumption of electricity increasing by 128% c. 1912-15, and gas by 62%, compared to only 11.6% for coal.³⁵ The general introduction of electrical power was emphasised by F. A Warlow, the managing director of Edgar Allen's in 1916, who claimed that the City Corporation had spent £1,344,000 on developing electrical supplies since 1910 and "There has been a very considerable increase in the demand for electricity with the various Sheffield trades."³⁶

Turning to developments in cutlery, Pollard has argued that "Progress was made mainly between 1914 and 1920, when investment in new equipment was speeded by the labour shortage and by existing and future prosperity." Increasing mechanisation of processes, particularly in forging, reduced labour inputs and labour-saving innovations were adopted in other stages of production.³⁷ Furthermore, electric welding machines and power presses had, by 1919, been introduced in larger firms such as Wostenholme's and Needham, Veale and

Tyzack.³⁸ However, this did not involve major changes in the structural characteristics of the industry, new machinery was not very costly, within the reach of even smaller firms, and few machines reduced labour inputs by more than half. Thus, the new techniques required the same degree of skill and training as the old.³⁹

This however may underestimate the extent of managerial initiative, particularly within larger cutlery establishments. Firstly, there was a growing integration between large cutlery firms and steel producers in procuring supplies of materials for manufacture, particularly stainless steel.⁴⁰ For example, Needham, Veale and Tyzack's entered into collaboration with the steel and tube manufacturing firm of S.E. Howell & Co. in 1917 for the supply of 25 tons, for three years, of non-corrodible steel for manufacturing table cutlery at existing market prices. The inability of this firm to offer larger quantities led to a joint purchasing agreement between Needham's and Wostenholme's to purchase steel from Firth's, securing preferential treatment on output, bulk purchasing, guarantees of the "lowest price", and exclusive use of trade marks.⁴¹

Secondly, attempts were made to introduce the US system of mass production. Herbert Senior, a Sheffield systematist working in the USA, wrote to Needham's in January 1915:

I have been studying systems under the best man in America ... and I will explain the amount of work that can be done ... and show you ... how much Sheffield is behind in the manufacture of spring knives ... Sheffield ought to be the leader in the manufacture of knives as she is world famed

but American firms can pay double wages and sell knives cheaper ... because she has paid more attention to detail, and got the machinery to do the hand work, working to 1000'ths of an inch.⁴²

Senior was appointed as works manager in March 1915 and directed to systematise operations with the aim of producing "economies" in manufacture. This entailed intensifying working hours, the introduction of machinery from the USA, and bonus schemes to induce increased work effort. Furthermore, production was now increasingly centralised, with the firm directly supplying its own steel to the workers thus, circumventing outside suppliers. However, the trade in general still remained sceptical and "We want to have everything on hand and show we are a success instead of a failure as predicted by ... the trade." The major obstacle here revolved around the problems of developing systems of supervision on a factory basis which would overcome the traditional bias of workers for outwork.⁴³

By 1918 there was growing interest amongst the larger cutlery firms in US techniques which intensified with the threat of post-war competition. The American Cutler noted in February 1918 that the US cutlery trade was buoyant; factories were organised to take advantage of the demand for standardised lines and manufacturers are "increasing facilities, building additions to their plants, and planning general developments of their productive facilities for turning out an increased volume of output with the limited supply of skilled labour at their command."⁴⁴ Certainly, Wostenholme's were keenly aware of the

future threat of US competition in cutlery and the need to introduce US techniques. In January 1918, George Quirk, an employee of the firm, was dispatched to the USA to study the machinery being utilised in the manufacture of knives. The high degree of mechanisation he encountered, and the increasing use of unskilled and semi-skilled labour across the various stages of production, from forging, grinding, stamping, cutting to final assembly is clearly emphasised in his report. For example, describing the grinding stage he noted that

The blades ... are ground and sharpened on automatic grinding machines ... One man tends to four machines, he stands in the centre ... and it takes the four machines to grind two blades ... the machine in the front of him grinds the right hand side ... and the machine behind him grinds the left hand side of the same blade.⁴⁵

Clearly impressed, the management proposed the introduction of US grinding machines to the Sheffield works in December 1918. However, this ran up against technical difficulties in installation and adaptation, and in acquiring supplies of the most technically sophisticated machinery. To counteract these difficulties the company employed an American consulting engineer, James Nell, to install equipment and supervise operations.⁴⁶ Indeed, by 1919 the advantages of the USA had induced management to negotiate to set up an American subsidiary. In May 1919 Bunting, a director of the firm, set out a detailed report on the advantages of setting up a cutlery factory in the USA. Firstly, it was argued that the loss of the US market by large German producers provided an ideal opportunity for capturing a large share of this trade.

Secondly, the firm could maintain its production of quality knives in Sheffield, shipping forged blades to the USA and utilising the modern methods and higher productivity of American workers.⁴⁷ This "Interchange of ideas" would have clear advantages for the firm: "Labour costs per dozen knives in the States are in most cases no greater than in Sheffield while the earnings of the workers are much greater. This is accomplished by the use of machinery."⁴⁸

This had a dual advantage; on the one hand, the firm could maintain its high quality lines in Sheffield and, on the other hand, utilise the USA factory for "popular Priced" products using Wostenholme forgings and brand names and develop a market for "moderately priced goods." As Bunting argued, they would have to conform to US practice, using the best methods which the Americans had copied from Germany, and they are "getting further and further from their original ideas which came from Sheffield."⁴⁹ During 1919, the firm made a number of advances to USA producers with the aim of purchasing works and finally agreed on the purchase of the Middleton works of the Schrade Cutlery Company for \$250,000. However, these plans were aborted due to government restrictions on capital exports, and, as an alternative, working arrangements were undertaken for the production of Sheffield forged blades in the USA.⁵⁰ The example of Wostenholme's both emphasises the efforts at modernising and the fact that cutlery lagged significantly behind best US practice by 1918. Indeed, a visit to 70 German

cutlery factories in 1919, by representatives of the Sheffield Cutlery manufacturers Association, noted the superior degree of mechanisation in German works.⁵¹

The increasing output of cutlery also focussed managerial attention on the need to reorganise their administrative mechanisms. For example, in 1917 the Sheffield Cutlery Manufacturers Association, responding to the recommendations of Government auditors, noted that accurate "scientific" systems for cost accounting in firms were inadequate, many firms having little conception of the need for accurate departmental accounting. This led to a distorted view of profits and a reliable industry wide system would alleviate the "unnecessary cutting of prices which often arises more for the want of knowledge of cost than from intention."⁵² Wostenholme's in 1915-16 were already acutely aware of these problems complaining of inefficiency and "a scramble in the entire business." To counter this, they employed government auditors and an outside advisor from the steel firm of Jonas & Colver to thoroughly investigate their accounting and office practice. As a result their book keeping procedures, foreign agency accounts, wage payments, and the general efficiency of the office and dispatch department, to deal with increased business, was upgraded.⁵³

The growing recruitment of technical engineers and the greater technical interconnections between firms is more clearly evident in the steel sector. In particular, the

complexity of electric steel production required trained engineers with a scientific knowledge of the process. For example, Beardshaw's noted the "necessity" of employing a trained metallurgist in 1917 to take charge of the electric steel plant, and a Sheffield man, C.L. Carlisle was appointed on a generous bonus scheme.⁵⁴ Furthermore, war demands required the increasing standardisation of steel products, especially for aircraft and vehicle parts, which in turn necessitated an increase in the number of trained technicians and "the supervision of output by the lab."⁵⁵

In terms of technical cooperation, the war marked a significant shift, particularly in the production of armaments; though closer cooperation had been evident before 1914 through firms such as the Sheffield Steel Makers Ltd, founded by Marsh Bros. in 1904,⁵⁶ and trade organisations such as the High Speed Steel Association, founded in 1907.⁵⁷ Although "secret organisations", they retained the services of the University metallurgist Oliver Arnold, and his services were made available to dozens of Sheffield firms.⁵⁸ The connection between industry and education was continued during the war through the work of the Sheffield University Scientific Advisory Committee, a body representing both businessmen and academics who offered their "scientific and expert advice."⁵⁹

In terms of inter-firm links, companies had made formal arrangement for the supply of basic steel and avoidance of competition before 1914. For example, Beardshaw's had made a

number of arrangements with Seebohm & Dieckstahl to make twist drills from steel produced by the company and extending patent rights. To avoid competition in European markets a formal agreement was entered into whereby the firms fixed prices to avoid underselling. However, the effects of competition from large producers such as Vickers were all too obvious to the management by 1914. In 1911, the firm had arranged a loose partnership with the Sheffield firm of Tidswells to produce twist drills which had proven unsatisfactory and this, together with increased competition from Vickers, induced the management to enter negotiations with "a suitable firm possessing up-to-date machinery for an alternative supply of twisted drills."⁶⁰

Cooperation on the supply of scarce alloys, essential to the production of high speed steels, was a key area of business integration during the war. This was partly forced on firms by government regulations in 1916 which set a standard scale of prices for high speed steel and tungsten and took control over the supply of Wolfram ore.⁶¹ However, cooperation between individual producers was clearly emphasised by the formation of the High Speed Alloys Co. Ltd., a Wigan based firm, in 1914, to secure a regular supply of tungsten and vanadium. A number of Sheffield firms invested in shares in this project, including Beardshaw's, Hadfield's, Spear & Jackson, Sanderson Bros. & Newbould, and Vickers, and by 1916 the firm had acquired extensive mining rights in Burma and Rangoon. In 1921 this firm supplied 85% of the country's tungsten supplies and Beardshaw's

alone held debenture stock to the value of £165,000 in 1925.⁶²

Cooperation on the crucial issue of wage control, however, was still a difficult policy to enforce, given the complexity of the labour market and the scarcity of workers in the heavy sector. As one would expect, the drain of labour to the war effort put a considerable upward pressure on wage rates in the heavy steel trade which affected unit costs. The expansion of wages during the war was emphasised by the president of the Chamber, Arthur Balfour, in 1920 who argued that it was essential that this reflected increases in productivity, and labour cost were seen as crucial to post-war competitiveness.⁶³ Attempts were made to establish across the board wage settlements, for example through the High Speed Steel Association, but often with only limited success.⁶⁴ Increased union agitation by the engineering workers during 1917 led to pay increases being made on a national basis, three times a year, and this was largely adopted by the various employers organisations in the steelmaking trades. This structure of arbitration remained in force until 1920,⁶⁵ however, the control of wage advances was a difficult procedure, given the scarcity of labour, and wage rates in the heavy trades rose steadily from 1914 to 1920 until it dropped dramatically in the depression of 1922.⁶⁶

In the cutlery trades, cooperation on labour matters was directed by employer agreements under the guidance of the Sheffield Cutlery Manufacturers Association. By an agreement of

December 1915, members of the Association agreed not to engage workmen employed by other members without consultation, and not to offer higher wages than those already paid under various agreements between the Trade Unions and the Cutlery Association. Disputes between employers were now to be settled by an elected board of arbitors.⁶⁷ This was a general trend in Sheffield and by 1918 Union amalgamation had been mirrored by the development of the Sheffield Light Trades Employers Association, formed of eight federated trade branches, all interlocked by agreements covering wages and hours and in some instances procedures of arbitration to avoid disputes.⁶⁸

However, employers' efforts to keep wages down were unsuccessful and wages rose steadily up to 1920 across all sections of the trade.⁶⁹ Pressures on wage rates due to labour shortages was especially acute in the cutlery trades, as the growth of controlled munitions firms in the City absorbed skilled workers, particularly from smaller firms.⁷⁰ For example, the Spring Knife Workers who had amalgamated and joined the National Amalgamated Union of Labour in January 1914 forced through significant wage advances between 1914 and 1917 with the employers' association. In August 1914, wages were advanced 5% for cutlers and grinders whether employed by piece or datal rates; in March 1915 an all round 5% with special bonuses for government contracts; in October 1915 and February 1917 a further 5% and 10% respectively. In November 1917, wages were set by arbitration and datal wages advanced to all sectors

of the trade.⁷¹ However, that these arrangements were tentative on the part of employers was emphasised by the Union's president, William Cooke in 1918:

Many firms are now paying in accordance with our lists; some are paying more; then there are others who are paying less ... It is to those firms who do not pay the Union rates that we must concentrate our attention.⁷²

So far, the notion of cooperation has focussed on loose trade agreements between employers and structures of arbitration. However, the war witnessed a number of large company mergers which increased the intensity of operations. In the heavy steel trade the most notable was the formation of the United Steel Company in 1917.⁷³ Such organisational developments were not simply confined to the heavy steel sector and in 1919 five large Sheffield cutlery firms forged closer links, with the aim of economising production and modernising plant and equipment.⁷⁴ It was noted that this was little more than a loose cartel structure, there was no effort to centralise managerial control, the firms still operating as individual business units. Nevertheless, the "coordination" of business activity, especially joint marketing agreements, was viewed as a mechanism for countering post-war competition and eliminating "that wasteful, throat cutting rivalry which has been a bane of the trade in the past." Such arrangements were thus seen as a means of maintaining individual identity, economising on marketing and purchasing, and avoiding duplication of products. This, argued the Sheffield Daily Telegraph, was a message which the still numerous small scale

firms would do well to follow.⁷⁵

In 1919, H.F. Smith outlined the advantages of combines and syndicates which,

based on economic principles are organised so that all firms taking part are linked up as one huge producing and distributing machine, with every department administered by a specialist, who brings to bear on his particular sphere of activity the highest form of scientific business training ... these surely are of more value than dozens of small firms acting independantly.⁷⁶

The reference to "economic principles" clearly defined combination for Smith in terms of a competitive market rationale, a rationale which despised the growth of monopolies aimed at maintaining prices and eliminating competition by the "unfair suppression of capital." Thus syndicates based on economic principles were designed to reduce competition "purely by methods of efficiency and superior organisation." The advantages of combination in cutlery would therefore take the form of increasing competitive strength through economies of scale.⁷⁷

Such arguments addressed fundamental problems in the cutlery trades which have been noted in earlier chapters. For example, Smith argued that combination would lead to increased specialisation by firm, thus reducing the duplication of plant and machinery and allowing factories to concentrate on specific types of machines. This would allow longer production runs and eliminate the costs of employing machinery to deal with a wide range of cutlery lines, thus leaving machinery idle for long periods. In turn, firms could simplify product lines,

concentrating on a few articles which would allow the application of the "scientific" principles of mass production and reduce the costs of marketing and transport. Furthermore, he argued that combination would reduce managerial and administrative costs and larger business units would gain easier access to finance capital.⁷⁸

Such arguments clearly applied to firms outside cutlery as emphasised by a proposed amalgamation of Spear & Jackson's edge tool business with a combine of four other firms in 1917, under the advice of Webster Jenkinson, an employee of the Ministry of Munitions.⁷⁹ The advantages of amalgamation and its association with economies of scale were clearly evident in the management's motives. The firm had "dissipated" their productive resources on producing three distinct types of articles, each conditioned by different customer preferences and the necessity for different plant, sales organisation, and technical and office staff. As the management claimed, "with the present state of commercial conditions and competition, the best success can only be secured by concentration and bulk production." This was crucial given the firm's perception of intense foreign competition after the war.⁸⁰ Furthermore, the firms could assimilate production techniques adopting the best methods and disseminate technical knowledge.⁸¹

However, managerial motives went further than securing economies of bulk production. Firstly, they argued that economies in marketing and sales was crucial to competitive

success and the concentration of the sales organisation both at home and abroad would effect a large saving in selling expenses.⁸³ This involved the use of joint agencies and sales staff, the pooling of resources to create an advertising department, and the development of centralised distribution which would stock large quantities and save on the costs of changing equipment. Secondly, the purchase of raw materials could be undertaken at reduced costs by utilising the cheapest supplier to the combined firm. Thirdly, combination would reduce the costs of holding large inventories which in 1913 had accounted for half Spear & Jackson's annual turnover. This large ratio of stock to turnover was in turn related to the economics of mechanised production. It was not economical to change machinery to produce less than a certain quantity, which in many cases would represent "an excessive stock", and the value of stocks in proportion to the turnover, and the interest on capital locked up in them, "could be very greatly reduced by combination and organisation." Finally, combination would facilitate a move towards the formation of a public company. Given the dominance of family share ownership within the various companies, and the fact that there is "no young blood coming in", the death of the majority shareholder under existing legislation would restrict the executors from selling the shares publically.⁸⁴

This clearly illustrates a drive for economy through combination, however the obstacles to merger were

insurmountable. The participation of Spear & Jackson in the merger depended on the retention of their steel business which was a continual stumbling block in negotiations.⁸⁵ The management argued that they were the only firm with experience of this business and they would be restricted by a joint board of management from undertaking the necessary investment for expansion. Indeed, the heavy capital outlay during the war in plant and experimentation and training, together with a glut in the market in 1920 caused by surplus government stocks of steel, had made this sector of the business unprofitable.⁸⁶ Furthermore, the question of managerial control became a central issue. In 1917, William McIntock, a Glasgow accountant acting for the combination, proposed the continuation of the existing firms in their corporate capacity on the lines of the Imperial Tobacco Co. "whose branches continue to use their original firm names."⁸⁷ This held little sway with Spear & Jackson who desired a centralised managerial structure, but for firms such as Skelton's it offered the opportunity of combination and the retention of a certain degree of individual control.⁸⁸ The major factor, however, was a lack of commitment by the firm's proposed partners to pool profits and investment in a centralised large and modern factory⁸⁹, and probably the failure of the firm to find any support amongst the large Sheffield firms such as Sorby's and Ward & Payne.⁹⁰ Negotiations broke down in late 1920, and in 1921 the firm acquired G.T. Skelton & Co. which was converted to an holding

company, subsequent to the formation of the new Sheffield Edge Tool Manufacturers Ltd.⁹¹

This chapter has identified the pattern of business expansion during the war, and illustrated a desire for closer business cooperation and formal amalgamation. However, in the last respect the response of businessmen was muted by the difficulties of overcoming the restraints on reorganisation. Furthermore, the ideals of merger came in the wake of a growing realisation that competition would resume its pre-war pattern and businessmen would have to develop more rational production and distribution mechanisms to compete. The slump of 1920, and the economic problems of the next decade, combined with increasing protectionism, was to bring these problems to the fore. The final chapter thus explores the 1920's in the context of the need for business reorganisation and the political response to foreign protection.

Notes and References

1. L. Hannah, The Rise of the Corporate Economy (1983), p.27. As K. Middlemass, Politics in Industrial Society, (1979), p.14, argues, "during the First World War, the relationship between the state and its citizens ... altered profoundly."

2. See, Middlemass, Politics, pp.51-119; A.S. Milward, The Economic Effects of the World Wars on Britain (1970); K. Burk (ed), War and the State, The Transformation of British Government 1914-1919 (1982).

3. Hannah, Corporate Economy, p.28.

4. In 1916, Sheffield produced 70% of war materials manufactured by private firms in the UK, and armament and munition output was treble the level of 1914. Sheffield the Arsenal of the World (1916), pp.12,17.

5. Hannah, Corporate Economy, p.28.

6. American Machinist, vol. 39, 1913, pp. 35E, 70E-1E. Both Vickers and Browns had large Admiralty orders in hand, and furthermore, there was a buoyant demand from the motor vehicle industry. Ibid., pp. 12E, 23E, 35E.

7. SCL, Records of the Chamber of Commerce (SCCM), LD1986(8), Minute Book, 3 Feb 1914.
8. W. Ripper, "Sheffield and the Conditions of Industrial Progress after the War", in Arsenal, pp.57-8.
9. J. Foreman-Peck, A History of the World Economy, p.188; S. Pollard, The Development of the British Economy (1983), pp.72-3; G. Hardach, The First World War 1914-1918 (1977), pp.139-73.
10. SCL, Records of J. Kenyon, 244/B1/1 Minute Book 1909-30, 22 Dec. 1914; 6 April, 25 Aug. 1915; 1 April 1916; 16 Dec. 1917; 17 Dec. 1918. The question of foreign debts was a major concern of the Chamber, see SCCM, LD1986(8), 7 Oct. 1914.
11. The trading account of the firm in Aug.-Dec. 1914 showed a decline of £8,978 over the similar period in 1913, and the ledger values of debts in South America and seven European countries, including Germany, were written down from £6,185 to £4,949 due to a fall in exchange rates and a suspension of payments. SCL, Records of Spear & Jackson, SJC69, Letter Book, S & J to Surveyor of Taxes, 9 June, 21 June 1915.
12. The firms were W. Hall Ltd., M. Eadon & Sons Ltd., F. Newton & Sons Ltd., S. Osborne & Sons Ltd. SCCM, LD1986(8), 7 Oct. 1914.
13. SCCM, LD1986(9), 6 July 1915.
14. Economist, 27 June 1917.
15. The export of steel to the USA increased from \$642,237 in Jan.-June 1915 to \$990,943 in the same period in 1916. Arsenal, p.54.
16. As Edgar Allen's noted, the plant is entirely devoted to "national defence" and has been "enlarged". Edgar Allen News, vol.1, no.1 (1919), p.6.
17. SJC69, S & J to Surveyor, 23 Aug. 1917. SJC70, Papers in Connection with Limitation of Profits on Controlled Establishments, Drabble & Sanderson to S & J, 5, 11 April 1917.
18. SJC69, S & J to Surveyor, 2 June 1916.
19. Ibid.
20. SJC70, J. Watson & Sons (accountants), to Ministry of Munitions, 11 April 1917.
21. Ibid., Memo to Heads of Department, April 1917.
22. S. Pollard, A History of Labour in Sheffield (1959), p.271.
23. SJC70, Memo to Heads of Department, April 1917.
24. SCL, Records of J. Beardshaw, MD7081(6), Minute Book, 26 March 1915.
25. The "Shells and Fuses" agreement of March 1915 permitted women and youths to work on repetitive tasks and men substituted on some skilled jobs; the "Dilution Scheme" of Oct. 1915 allowed the up-grading of semi-skilled workers, and the "General Substitution Scheme" of Sept. 1916 allowed women to secure highly skilled jobs. Pollard, Labour, p.271; G.D.H. Cole, Trade Unions and Munitions (1923), pp. 132-4.
26. Extensive growth refers to expansion by means of an increase in the number of workers and of the existing vintage of machines and equipment, referred to as capital widening growth. Intensive growth occurs not merely by increasing existing inputs but by increased productivity, associated with improvements in plant, equipment, techniques etc, referred to as capital deepening. See K. Smith, The British Economic Crisis (1984), p.38.
27. SJC70, Memo to Heads of Department, April 1917. Workers employed as on 31 Dec. 1912, 527; 1913, 500; 1915, 421.

28. G. Tweedale, Sheffield Steel and America (1987), pp.47, 51-2. Vickers added a 2½ and 3 ton Heroult furnace in 1916, making four; Firth's, two 7 ton, two 6 ton and one 1 ton making eight; Hadfield's, four 8 ton, one 3½ ton and one 1½ ton making ten. In 1915 Brown & Baileys installed an electric furnace to produce stainless steel, and developments in this process led to the introduction of the improved and more cost effective Greaves-Etchells furnace by a number of leading producers, the firm of Kayser & Ellison operating two by 1917. Ibid., pp.51-2.
29. Two 10 ton electric furnaces were installed at a cost of £6,446. SJC70, S & J to Surveyor, 23 Aug. 1917; Memo on Freehold Works etc. 1915-16.
30. SJC69, S & J to M.B. Mulligen (Glasgow), 25 Feb. 1916.
31. Ibid., S & J to Surveyor, 3 Jan. 1918.
32. SJC70, Memo to Heads of Department, April 1917; 12 March 1917.
33. MD7081(6), 30 Jan; 26 July 1917.
34. SJC70, J. Watson to Ministry of Munitions, 11 April 1917.
35. Ibid., Memo to Heads of Department, April 1917.
36. The consumption of electricity in Sheffield increased from 21.7 million units in 1913 to 77.9 million by 1916. Arsenal, pp.33, 52. The question of cheap municipal supplies of electricity was frequently discussed by the Chamber, see SCCM, LD1986(9), 14 May 1917.
37. Pollard, Labour, pp.293-4.
38. SCL, Records of Wostenholme's, Wos R7, Papers Relating to New Machinery, Perkin & Co. Ltd. (Leeds) to Wostenholme's, 11 June 1919.
39. Pollard, Labour, pp.294-5.
40. "To ply his trade, the cutler has to resort to the iron and steel manufacturer for his raw material." Industrial Sheffield and Rotherham (1919), p.148.
41. SCL, Records of Needham's, NVT12, Trade Agreements, Howell & Co. to NVT, 27 Aug., 30 Aug. 1917; F. Best (Firth & Sons) to NVT, 3 Sept. 1917. Wostenholme's had used high grade steel supplied by Firth's since the 1890's. Wos R4, Letters, Wostenholme's to Empire Knife Co. (Connecticut), 11 Feb. 1895.
42. NVT12, H. Senior (USA) to NVT, Jan. 1915.
43. Ibid., NVT to H. Senior (USA), 15 Jan. 1915; 10 Feb. 1916.
44. The American Cutler, no.104, Feb. 1918, pp.5-6.
45. Wos R7, G. Quirk to Wostenholme's, 11 Jan. 1918.
46. Ibid., 4 Dec. 1918. Ironically, Nell was a Sheffield immigrant to the USA in 1890, formerly being employed by Needham's, and gaining experience in American methods by working for a number of firms.
47. Wos R8, Correspondence on Proposed Factory in the USA, Statement by Mr Bunting, 6 May 1919.
48. Ibid.
49. Ibid.
50. Ibid., Wostenholme's to J. Shrade (NY), 8 Aug. 1919; Quirk to F.B. Colver, 21 May 1919; Shrade Cutlery Co. to Colver, 17 May 1919.
51. NVT22, Report of the Sheffield Mission to Solingen, July 1919.
52. NVT21, Circulars of the Sheffield Cutlery Manufacturers Assoc., N.H. Deakin (Secretary) to W. Tyzack, 17 Oct. 1917; Circular, "How Do You Know You Are Making a Profit if You Don't Know Your Own Costs", Oct. 1917.
53. Wos R6, Office Reorganisation, Memo by J. Colver, 18 Nov. 1916; Nixon

- to Colver, 1 Dec. 1915; Memo on Revisions in Arrangements in Office, Feb. 1916.
54. MD7081(6), 24 Aug. 1917. The firm also appointed, under government approval, E. Pilgrim, an employee of Woollich Arsenal, as chief chemist, 4 April 1917.
55. Edgar Allen News, vol.1, no.1 (1919), p.1.
56. The object of this formation was to acquire the steel works of P.R. Kuenrick, the managing director of Marsh Bros., who operated at Ranmoor, Sheffield. The firm was formed with a capital of £100,000. SCL, Records of Marsh Bros., Marsh 107, Papers Relating to Sheffield Steel Makers, Memo and Articles of Association, 31 Aug. 1904.
57. Under its rules of association, technical issues relating to the manufacture of high speed steel were to be made more available to firms. Marsh 108, High Speed Steel Assoc., Heads of Rules for Consideration, 22 July 1907.
58. Tweedale, Sheffield Steel, pp.64-5; M. Sanderson, "The Professor as Industrial Consultant: Oliver Arnold and the British Steel Industry 1900-14", Econ. Hist. Rev., vol.31, no.2 (1978), pp.585-600.
59. SCCM, LD1986(8), 1 Dec. 1914.
60. MD7081(6), 24 March 1911, 15 May 1914.
61. SCCM, LD1986(9), 24 Feb. 1916.
62. MD7081(6), 21 Nov. 1914; 8 Oct. 1914; 13 Dec. 1919; MD7081(7), Minute Book, 29 June 1925; SCCM, LD1986(10), 22 March 1921.
63. SCCM, LD1986(9), 20 March 1920.
64. Marsh 108, High Speed Steel Assoc., Wage Agreements, 1916.
65. Pollard, Labour, p.267.
66. From an index number of 100 in 1914, wages by 1920 had increased to 219 and 209 for the heavy and light trades respectively, falling to 160 and 177 in 1922. Ibid., p.325.
67. 29 Sheffield firms signed. NVT21, Agreement re Employment of Workmen, 12 Dec. 1915; List of Firms who have Signed Agreement, 25 April 1916.
68. Pollard, Labour, p.301.
69. Ibid., p.325.
70. Arsenal, p.25.
71. Wos R23/11, Spring Knife Workers Amalgamation, Secretaries Report for 1918.
72. Ibid.
73. The main driving force behind this merger between 1916-18 was the large specialist steel firm of Steel, Peech & Tozer, the new company having a wide geographical sweep but a "compact nucleus in Sheffield." J.S. Boswell, Business Policies in the Making: Three Steel Companies Compared (1983), pp.42-3.
74. The firms were Joseph Elliot & Sons, Lockwood Bros. Ltd., Needham's, Thomas Turner & Co. Ltd., and Southern & Richardson Ltd. Telegraph, 22 Oct. 1919.
75. Ibid., 22, 24 Oct. 1919
76. H.F. Smith, "Would a Cutlery Combine Pay?", in Telegraph, 30 Nov. 1919.
77. Ibid.
78. Ibid.
79. SJC71, Papers Relating to Proposed Edge Tool Amalgamation, W.

Jenkinson to A.K. Wilson (Managing Director), 23, 24 May, 4 June 1917. The four firms were private family owned liabilities: W. Hunt & Sons (Birmingham), share capital, £100,000; C.T. Skelton (Sheffield), £50,000; I. Nash & Sons (Stourbridge), £45,000; I. Nash (Belbroughton), £20,000. SJC71, List of Companies Capital, 1920.

80. Ibid., Draft Proposals on Amalgamation, July 1920. The firm offered the combine a large turnover in world markets based on quality, and prices "which we believe are higher than those charged by other firms in the trade."

81. Ibid., Wilson to Skelton & Co., 27 July 1917.

82. For example, they estimated a saving of £3,400 a year on London sales, and the joint production of catalogues would considerably reduce stocks. Ibid.

83. Ibid.

84. Ibid., Draft Proposals, July 1920.

85. Ibid. In fact, the steel department produced only 10% of the company's steel for edge tool manufacture in 1920, supplies being largely purchased from outside.

86. Ibid.

87. Ibid., Suggestions by W. McIntock re Consolidation of Various Businesses at Present Manufacturing Edge Tools, 3 April 1917.

88. Ibid., Wilson to Skelton's, 27 July 1917; Memo of Conversation between W. Jenkinson and Skelton's, 19 Dec. 1919.

89. Ibid., Hunt & Sons to Wilson, 16 April 1920.

90. Ibid., Wilson to R. Sorby & Sons, 26 Sept. 1917; Wilson to Ward & Payne, 26 Sept. 1917.

91. SJC72, Papers Relating to Proposed Amalgamation with G.T. Skelton, 1921.

Business and the State: Sheffield in War and Depression, 1914-1930

The general approach of this thesis has been to explore the growth and development of Sheffield's business structure from the point of view of business strategy, which incorporates both an economic and political view of the business system. The economic constraints on growth have been emphasised and it has been argued that the response of businessmen to these changes was incomplete, especially in cutlery where the reliance on quality and skilled labour militated against successful competition in the long-run. However, developments in special steel making skills up to 1918 provided new market opportunities for specialist steel and tool firms, and the expansion of armaments saw the growth of large business units. Furthermore, chapter 2 argued that the day of the small-scale firm was by no means at an end by 1900, although the war in particular saw a business movement towards growth through combination and merger. It is not here the intention to reiterate these points in detail but to explore these issues in relation to developments in the 1920's, a decade which witnessed mass unemployment and problems of overproduction, and brought back memories of the 1880's and 1890's as a period of economic crisis. It was a decade too, which saw the re-emergence of the fiscal debate, and the protection of steel as a special interest became the political prop of Sheffield's

ailing industrial sector.

The last chapter outlined a process of growing economic interconnections between business firms in Sheffield up to 1920. The unity of Sheffield's business system was also to take on a political expression during the war and its aftermath. This expressed itself in a number of ways. Firstly, there was growing interest in local trade bodies such as the Chamber of Commerce which witnessed a large increase in members during the war years.¹ Indeed, this was to mirror a growing interest amongst businessmen in developing wider links with corporate institutions such as the Federation of British Industries, founded in 1916, which attempted to represent the general interests of business in relation to Government.² The Sheffield Chamber, in 1916, commented on the need for national industrial representation to promote and debate the policies for post-war recovery, and this was to be achieved through institutions such as the F.B.I.³

Secondly, Sheffield businessmen united behind a policy of government intervention to facilitate and protect Britain's post-war commercial position. In February 1916, the Sheffield Telegraph ran an article entitled "Tariff Converts in Sheffield", and concluded that "Whatever differences of opinion there may be in the Manchester Chamber of Commerce on the subject of trade after the war, none was apparent in Sheffield."⁴ In January 1916 the Chamber unanimously passed nine resolutions outlining policies for reconstruction and

defining their attitudes on trade policy after the war. This included a plea for the government promotion of Empire trade, preference in Colonial markets, and the establishment of "countervailing" duties aimed at suppressing dumping and promoting exports to the Empire.⁵ Such views were clearly to influence the conclusion of the Departmental Report on the Iron and Steel industry of 1918 which claimed that protective duties were now essential to the safeguarding of this vital national industry, and recommended anti-dumping legislation.⁶

For Sheffield, the development of trade was now seen as a "key area of government activity" and they argued for an "infusion" of businessmen into government ministries and the establishment of a Ministry of Commerce. Attached to these aims was a clear desire for financial aid to key industries defined in terms of "national safety", sectors which had previously been the monopoly of alien countries,⁷ and the role of government should now be extended to the development of scientific and commercial education which was viewed as a crucial part of national expenditure.⁸ In many ways, these were an extension of earlier aims to promote the expansion of overseas trade, but were now linked to a sweeping analysis of Britain's position vis-a-vis the likely resurgence of Germany as a major post-war force in world markets.⁹ According to Tolliday, fears of intense competition, economic nationalism, and a breakup of the established economic order, was a potent force in the steel industry's claims for protective action.

Indeed, the economic collapse of Germany muted the steel industry's call for protection and the brief post-war boom witnessed a "swing back against protectionism ... with free trade as an acceptable corollary to speedy de-control of the industry."¹⁰

A swing back to free trade, however, is not evident in Sheffield, although the assumed German threat was at the forefront of proposals for post-war recovery. For example, Herbert Hughes, the President of the Chamber in 1916, alluded to the economic aggression of Germany before 1914,¹¹ and in 1917 a proposal to form a UK Manufacturers Export Company was directly linked to counteracting the assumed advantages of Germany in cartel structures and superior sales organisations. This last point is interesting, as the notion of promoting trade was clearly linked to the need for the structural reorganisation of industry. An export company would promote the reorganisation of sales methods, coordinate the changes of patterns to suit various markets, provide commercial and technical information, foster the development of new product lines, assist small business to meet foreign competition, and investigate the operations of underselling by cartels. Firms were now adapting in preparation for the return to normal competition and "Premises are being extended, improved plant installed and up-to-date methods adopted ... This forward movement is conspicuous in the old craft industries as well as in the more modern steel trades."¹² Furthermore, they took up

eagerly the recommendations of the Farrington Committee on the Financial Facilities for Trade, of 1916, which advocated the establishment of a UK Trade Bank.¹³

In terms of trade protection, this remained high on the Chamber's agenda, even after the collapse of Germany, and business remained committed to pressure government for intervention. However, the exact role of government in industrial affairs was here clearly demarcated. For example, government control over industry and the role of the state in restructuring the steel industry was, from the beginning, a non-starter. In 1915 the Chamber had accepted the general principle of government taxation but had firmly resisted the introduction of excess profit duties as a clear "interference" by government to the legitimate operations of individual enterprise.¹⁴ That this tax was still in force in 1921 caused consternation amongst businessmen, especially as the preceding inflation had increased the valuation of stocks for tax calculation, leaving firms with a high tax burden in a period of business contraction and falling inventory values. As Arthur Balfour forcefully argued,

It was simple ruination ... to take a partner ... the Government ... in 1914 when there had been low priced stocks and low priced contracts, and that the Government should calmly walk out of the business ... and leave the original proprietor with ... large taxation and

liabilities owing .. on the strength of the valuation of these stocks.¹⁵

A similar stance was evident in their objections to Government interference in the railways proposed in the Government White Paper of 1920. Unanimously adopting a resolution by W.S. Skelton, they claimed that "the form of management and direction of the railways should be left to the Railway Companies ... without interference from the Ministry of Transport ... it will diminish individual incentive to good working and would certainly tend towards eventual nationalisation."¹⁶

Here of course was a major contradiction in business policy, on the one hand an undying faith in the ability of the market to promote business efficiency and growth, and on the other hand the use of tariffs to protect industry was a clear denunciation of the market. The ending of the short post-war boom in mid-1920 reinforced the argument that industry must protect itself against foreign competition. Indeed, the "steel industry was the only major industry that continued to seek protection throughout the 1920's".¹⁷ However, for the steel industry it was to be a decade of frustrated efforts to secure a political response by government to the industry's competitive decline. As Arthur Balfour put it in 1921, "The government had promised an Anti-Dumping Bill and a Key Industries Bill. Both of these Bills ... were of vital

importance to the Sheffield industries."¹⁸ The passing of the Safeguarding of Industries Act of 1921 placed a 33% ad valorem duty on 6,500 products considered to be of strategic importance.¹⁹ This included tungsten and magnets which was well received in Sheffield as a crucial step in protecting the inputs of key raw materials to the steel and engineering trades.²⁰

However, legislation went no further, and the world wide slump of 1920, together with wide variations in exchange rates, put increasing pressure on Sheffield firms. The depreciation of European Currencies was of especial concern to steel producers and "robbed progressive firms of the advantages of capital investment in new plant ... and increased capacity." In particular high speed steel producers, although competing in terms of cost, quality and uniformity, found that high grades, although in demand, were restricted by high prices due to unnatural competition caused by currency depreciation.²¹ Beardshaw's, for example, were forced to close their crucible and high speed steel plant for a time in 1922 and noted the difficulty of the high exchange rate with Europe.²²

Similarly John Kenyon & Co. were optimistic about the outlook of trade with the Continent in 1920 although working under the considerable handicap of depreciated currency. However, by 1921 depreciation and the stagnation of Continental markets, especially the virtual loss of Soviet trade, forced the management to cut wages and introduce economies in general

expenses "with a view to bringing the costs, and charges into harmony with the reduced turnover." For this firm, continued stagnation and currency instability was to force the firm to seek financial loans. In 1925, a partnership was arranged by the Midland bank with the Engineering and Mercantile Co. of London, to inject new capital, and take over the firm's sales operations in the USSR and Poland, under the title of J.Kenyon & Co. (Export) Ltd. However, the collapse of the firm's foreign sales in 1929, and the failure of the bank to intervene forced the company to wind up its affairs in 1930.²³

Furthermore, the loss of markets during the war, and the build up of steel capacity after, severely disrupted Sheffield markets. The Chamber in 1919 commented on the fact that since the end of war both France and Italy were "planning to make themselves as far as possible independent of Sheffield for high speed and crucible steel and tools."²⁴ The cutlery trade was similarly affected. For example, Wostenholme's Canadian agent informed them in 1922 that the inability to guarantee a constant supply of IXL during the war had severe repercussions on their business. Canadian retailers had turned to US suppliers and "almost every firm got loaded up with a tremendous overstock, particularly on pocket knives, razors and ... carvers."²⁵

The steel industry found little protection from these competitive constraints in the 1921 Safeguarding Act, and the failure to expand the Act to steel in 1926 meant that currency

depreciation, which allowed foreign dumping, and the problems of maintaining Sterling on the Gold Standard was to seriously affect the industry's competitive strength throughout the 1920's.²⁶ As Tolliday points out, for the Baldwin Government in 1925-6, support of the "ailing" steel industry had to be weighed up in relation to the demands of other declining sectors of industry. Indeed, at a national level the industry was hardly united, the main trade association, the National Federation of Iron and Steel Manufacturers were mute in the tariff election of 1923 and took a neutral stance in regard to applications for the extension of safeguarding to the Cunliffe-Lister Committee in 1925.²⁷

A united front by the industry thus came piecemeal, region by region, as the impact of the changing external trading environment, and the labour unrest of 1926, hit home the fact that depression was not a temporary aberration.²⁸ In this context, the views of Sheffield businessmen on the nature and causes of the depression are worth considering. In 1921, Arthur Balfour had clearly expressed the view that the depression was cyclical in nature and argued that "after a great war and a period of great inflation there must be a period of recovery and great deflation, particularly on this occasion when capital was spent like water and regarded as income."²⁹ Thus blame was laid on high spending by local and national government. The depression was therefore viewed as a purely monetary phenomenon, the failure of government to control expenditure

and thus to reduce inflationary pressures. According to Balfour, however, what government had not foreseen was that this would be accompanied by a "temporary" fall in exports.³⁰ Therefore, trade issues were merely viewed as cyclical in nature, and would right themselves as currency markets realigned and foreign nations recovered. It obviously followed, that the remedy to depression was national economy and the introduction of a policy of tight money, with protection allowing a breathing space to ride-out the slump.³¹ Sheffield businessmen were now to fully accept the orthodox policies of various national governments in the 1920's concerning domestic economic policy.

In 1921, the Chamber had unanimously accepted Balfour's endorsement of the increase in Bank rates on the grounds that it had "steadied" speculation and the "Present unemployment was the result of economic waste and the interference of politicians in business."³² They were now to pursue, with some vigour, a call for cuts in expenditure at all levels of the economy. For example, in 1923 they presented a resolution to the Associated Chambers arguing that reductions in Government expenditure and taxation were a prerequisite to the "revival in the industry and commerce of the country, or any reduction in the number of those at present unemployed."³³ Indeed, the Chamber had presented Geddes with a stainless steel axe on his visit to the City in 1922, and supported cuts in social service expenditure, education, and defence. The last issue was of

course controversial, given the dependence of the heavy industries on government contracts, and Thomas Vickers argued that this would be detrimental to Sheffield trade. Indeed, by 1923 the Chamber was vigorously petitioning the Admiralty and War Office to provide orders and "stimulate" business.³⁴

The pursuit of national economy was also directed at the Sheffield Municipal Authority. Here the attack took on a number of directions but the key issue revolved around the question of wage rates and the effects of unemployment and benefit systems. In 1922, the President of the Chamber William Clarke had condemned the Municipal Authority on the grounds that "when Sheffield industry was cutting wages and decreasing employment it was not unreasonable that similar economies should be affected by municipal authorities."³⁵ In particular, the higher wages paid by the authority to employees compared to private enterprise was seen as a means of keeping wages at "uneconomical levels."³⁶ Similarly, the coordination of unemployment relief, "in some districts equal to and sometimes greater than the standard rate of wages", was seen as a factor in raising production costs and keeping local rates and taxes high.³⁷

With hindsight of course these views can be seen as misleading, the problems of the 1920'S were related to the fall of world wide demand and the build up of excess capacity which had been evident before 1914.³⁸ Sheffield industry needed to restructure itself to meet changing market circumstances.

Attached to this, the industry faced pressures from high labour costs, high transport costs, and the problems of the coal industry and the high cost of fuel. As in earlier periods, the issue of wage rates and the cost of production became of central importance to businessmen faced with competitive pressures. For example, there were numerous complaints concerning the high cost of coal and electricity supplies and of overcharging by the railway companies.³⁹ But here the response of the Chamber to government action was mixed. On the one hand, they supported the Mining Association in their plea to government not to impose minimum wages in 1924 which was seen as a "disguise for nationalisation", and further opposed the Government's Electricity Supply Bill of 1926, for the formation of a national grid, on the grounds that free competition would provide supplies at the lowest cost.⁴⁰ However, the ability of the railway companies in the region to double their charges over 1914 levels led the Chamber in 1925 to insist upon rationalisation of the railways and government should exert pressure to "ensure immediate reductions in all classes of rates."⁴¹

These factors now merged in 1925 with the realisation that the slump in world trade, apart from the brief interlude in 1923, when the Rhur crisis revived Sheffield's heavy industry,⁴² was more protracted than had been realised in 1921. Furthermore, businessmen now resented the protection of sheltered industries such as coal and railways from foreign

competition, and the Chamber bitterly denounced the government subsidy to the coal industry in 1925 as a "serious handicap to those industries subject to independent foreign competition, and a serious grievance to manufacturers endeavouring to secure export business."⁴³ Thus the principles of protection should be extended to steel and as Arthur Balfour argued in 1932, "You cannot allow this country to fall as a producer of iron and steel (which comes as near to being a key industry as anything) to the point where our imports are greater than our manufactures."⁴⁴ This was reinforced by the intensification of dumping and the raising of tariff barriers against the industry. In other words, as in the pre-1914 period, unfair competition, which distorted the free operations of the market, was the driving force behind calls for protection.

The question of dumping and increases in foreign tariffs was after 1925 to become the cornerstone of the Chamber's attempt to extend the principles of safeguarding to the industry, and in the depression of 1929 in their call for a general protective tariff. That the extension of safeguarding was widely supported by all sections of Sheffield's trades was shown by a referendum in 1928 which was overwhelmingly in favour (Table 9:1). The question of foreign tariffs was particularly relevant to high speed steel producers. For example, an increase in the French Tariff in 1921 discriminated against "fine steel for tools and special steels",⁴⁵ and the Fordney Tariff in the USA of 1922 placed an ad valorem duty of

47% on high speed steel as against 20-26% for ordinary crucible steel. The US tariff, was viewed as highly

prohibitive unless the fall in the value of the Pound as compared with the Dollar ... has the effect of enabling manufacturers on this side to secure for special lines and well known brands a certain amount of business, even against the prohibitive duties now imposed.⁴⁶

In 1924, C.W. Kayser, giving evidence to the Balfour Committee on behalf of high speed steel firms, argued that exports had virtually ceased owing to increased duties of 230% since 1918.⁴⁷

Table 9:1: Ballot of Sheffield Businessmen in 1928 on the Question of Extending the Principle of Safeguarding to the Iron and Steel Industry.

Industry	Yes	%	No	%
Iron & Steel Trade	208	93	15	7
Cutlery, Tools, Silver & Allied	115	92	10	8
Engineering	22	96	1	4
Other Trades	70	86	11	14
Total	515	92	46	8

Note: 62% of all ballots were returned.

Source: Sheffield Chamber of Commerce, Annual Reports 1920-29, 26 March 1929.

The US tariff clearly hit those trades which were geared towards quality and high market prices. What was true of quality steel was also true of quality cutlery lines.⁴⁸ For example, Wostenholme's like a number of large Sheffield producers had since the war expanded their foreign stockholdings. In 1922, they complained of continual correspondence from the USA and Canada which claimed that prices were 100% above pre-war levels. The management were forced to offer a discount of 33½% on the grounds that "If we can't sell them now it is unlikely that we shall do so after

they have been replaced on our shelves by makers less dilatory than we."⁴⁹ In 1931, the Company discontinued the maintenance of its New York office as "The duties on our goods are so high, the expenses so heavy and the sales so small that the office has not paid us for some years."⁵⁰ Between 1926 and 1930 the company made a continual loss on its New York business as US sales and shipments fell and stocks were reduced (Appendix F, Table 1).⁵¹ In 1931, when the firm attempted to sell off its remaining stocks worth £5,764 at invoice prices they calculated that 20% of the invoice price was accounted for by import duty which virtually prohibited a sale, unless prices were slashed leaving little margin for profit.⁵² Thus high duties worked against a strategy of holding large foreign stocks and as one of the directors argued, "I often thought it better to have nothing in America except samples and to let customers import themselves and pay their own duty."⁵³

Certainly, evidence presented to the Balfour Committee by a number of Sheffield businessmen in 1924 supports the argument that foreign tariffs were a severe constraint on trade. Attached to this, dumping was seen as a major factor in the inability of Sheffield to resist foreign competition.⁵⁴ Arthur Balfour had little doubt that dumping was a major factor in the steel industries competitive decline when he claimed in 1932 that "We have become the safety valve which enables high protectionist countries to keep going on dumping their surplus goods."⁵⁵ In December 1920, the Cutlery Research Association

noted that German producers were increasing the range of their product lines and dumping goods in Sheffield at low prices and bearing no mark of origin.⁵⁶ German dumping was also evident in Dominion markets. For example, in 1925 three small Sheffield firms complained of the penetration of cheap German cutlery and tools in Australia, and a series of letters from Commonwealth importers supported the view that since the removal of the embargo German cutlery was being imported in large quantities at less than cost price.⁵⁷ In 1922, W.F. Beardshaw argued that steel producers should switch to Dominion markets given the high exchange rates operating in Europe.⁵⁸ However, the extent of German competition in Australia was such that even with a 15% preference in favour of Sheffield steel in 1927 "it was considerably difficult for firms to compete there."⁵⁹

That the problem was linked to German business organisation was exemplified in 1923 when the Chamber petitioned the Foreign Secretary to the effect that trade was hampered by the "great activity and ample financial resources of German firms ... supported by their German principles at home."⁶⁰ This was again to reinforce the response to closer ties with the Dominions which had been a major part of the protectionist stance of the industry before 1914. In 1928, the Chamber called for the removal of restrictive tariffs in the Dominions, and at the height of the depression in 1930 supported a resolution from Robert Hadfield supporting greater cooperation with the Dominions through the formation of an

As Capie argues, dumping became a "catchword for unfair competition", but also has an economic meaning in the sense that it represents the difference in the selling prices in domestic and foreign markets. He further argues that the existence of long-term dumping below the cost of production is problematic for the 1920's although there "would appear to be short-term dumping." In terms of iron and steel, he claims the evidence from businessmen was never convincing and no protection was given to the industry under the Abnormal Importation Act of 1931.⁶² This, however, misses two important points. Firstly, as noted above, dumping was not simply viewed as a problem of the domestic market but was being felt in overseas markets. Secondly, although we can agree that the evidence for dumping below cost in Sheffield supports the notion of short-term dumping, businessmen related the problem to the long-term competitive strength of industry, and the superior production power of German manufacturers who were being cushioned by tariff walls. This was evident in the Chamber's response to the Imports and Exports Regulation Bill of 1919 which had attempted to counteract dumping. As they argued in 1921, this was adequate for preventing goods being dumped at a lower price than in the country of origin but

those provisions were not in the nature of protection of home industries, and gave no safeguard against ... foreign producers, who, on account of their superior means of production, are able to sell their goods here at less price than they can possibly be sold by the home producer.⁶³

Thus dumping was related to the structural problems of the industry and the ability of Germany to undersell because of larger-scale and cheaper methods of production. In turn this demanded that industry should be protected in the short-run from such competitive disadvantages. This, in itself, denied a key assumption of free trade theory, namely that firms should be allowed to compete in the cheapest market. Nevertheless, the pricing strategy of firms in the slump indicates that underselling by foreign producers was a short-run factor in pushing prices downwards. The Foundry Journal noted in 1921 that German and Belgian steel producers were pursuing "a vigorous undercutting price campaign", forcing Sheffield firms to respond by pushing prices down often to unremunerative levels. For example, in March 1921 the Bright Steel Makers Association decreased prices from £32 to £25 and the price of steel hoops fell from £39 in October 1920 to £20..5s by April 1921.⁶⁴ Firms producing Open-hearth and Bessemer steel were, in 1922, quoting at marginal prices "and some Sheffield manufacturers, working practically without profit, tried to stimulate a demand in steel for export. In this they were partially successful."⁶⁵

The pressure of foreign competition on the downward spiral of prices was especially acute in the specialist quality lines. In December 1919, the steel firm of Wilfred Burkinshaw Ltd. had noted that prices for high speed steel were "on a continually upward path due to the large demand both in domestic and

foreign markets."⁶⁶ However, by 1921 prices were so high as to be "almost prohibitive ... in most of the world's markets."⁶⁷ The reliance of firms on quality was again at the forefront of business strategy. In 1921 Professor C.H.Desch, a member of the Sheffield branch of the Cast Iron Research Association, had argued that "The great and essential feature of Sheffield Industry was not the quantity or cheapness of the steel produced, but the making of good steel."⁶⁸ This of course was hardly feasible given the collapse in demand in 1921 and the enhanced and cheaper production of foreign competitors. For example, the price of Sheffield crucible steel in 1921 was considered too high, and the rapid introduction of the electric furnace for producing tool steel in the USA, and on the Continent, gave a cost advantage over the high cost steel manufactured in coke-fired crucibles. Thus producers were forced to push down prices and reduce the cost of production. However, the advantages of Germany in cheaper labour, fuel, and transport costs, put the industry under severe competitive pressures and forced prices down further.⁶⁹

A particular problem facing the steel sector was the competitive decline of the specialist steels, which had provided a bulwark for the industry against US competition before 1914. Here the failure to widely adapt the electric process to the production of bulk high grade steels has been levelled at the industry. For example, in 1928 the UK produced 86,800 tons of electric steel compared to 612,599 tons in the

USA.⁷⁰ The slow diffusion of this process in Sheffield, a city which had been at the forefront of this technology before the war, has been analysed by Tweedale. He claims that a number of factors restricted the process in Sheffield. These included the high cost of capital investment where tonnage was the chief requirement in the finished product; the high comparative cost of UK electricity; the conservatism of steelmakers who argued it produced an inferior product; the problems of adaptation which required skilled labour which was fully conversant with the technical problems of the process.⁷¹

However, this fails to consider the consequences of overcapacity during the war which with the end of the boom in 1920 left producers with a falling demand for high grade bulk steel. In 1921, the smallest commercial electric furnace was 10 tons which was found to be uneconomical for many brands of steel. The demand for armaments and large castings during the war had made the process economical, but with the end of the boom firms were faced with excess capacity as the industry returned to the production of high grade steel castings, stainless steel, and medium-sized orders "which are found to be too small for the open-hearth and too large for the crucible." To combat this, firms attempted to reduce costs by introducing the "Duplex Process" which combined traditional cupola smelting with electric smelting.⁷² Nevertheless, one is left with the impression that the decision to invest in electric production was constrained by purely technical and cost considerations.

Firms did not realise that the process provided the opportunity to develop new high quality product lines, and thus "comparative costs as regards other processes can be ignored, as an entirely new market is created."⁷³

Therefore, the collapse of the post-war boom in 1920 had left the industry facing a serious overproduction problem, and surplus stocks could not be sold given the cost constraints on the industry and the high prices charged vis-a-vis her foreign competitors. As the Foundry Journal noted in 1921, the recovery of Sheffield steel was retarded by low demand and excessive costs, and although prices had fallen "competition ... is keen, and price cutting is reported in more than one department of the steel trade."⁷⁴ One obvious consequence of this was a breakdown in the pricing policies of the various trades associations as competition forced firms to pursue an individual strategy. In 1921 a number of firms cut rates below those fixed by the High Speed and Crucible Steel Associations,⁷⁵ and a number of firms discontinued the price agreements with the Saw and Edge Tool Manufacturers Associations.⁷⁶ In 1924, Beardshaw's resigned from the High Speed Association on the grounds that competitive pressures militated against joint action on prices.⁷⁷ Similar problems were faced in the cutlery trades. In 1922 the management of Wostenholme's split on the question of breaking with the Cutlery Manufacturers Association and introducing separate wage bargaining structures, allowing greater flexibility in

pricing. The desire of the directors, J.C. Wing and F.B. Colver to reduce selling prices and follow the lead of the Association in cutting wages was firmly resisted by the Managing Director, J. Paine.⁷⁸ These problems resurfaced in the depression of 1929-31. For example, in 1931 Firth's complained of underselling by Beardshaws and, in 1932, the Crucible and Tool Steel Association noted the difficulty of persuading firms to maintain prices for high grade steel.⁷⁹

The movement towards protection was therefore related to competitive pressures, in the face of fierce price competition. One obvious response was to meet competition head-on and rationalise production to meet the larger output and cheaper production of competitors. According to Tolliday, British steel manufacturers, by 1925, saw an intimate connection between tariffs and the rejuvenation of the industry. A prohibition on imports would transfer demand to domestic producers and thus stimulate investment in larger plant and equipment. Thus reorganisation required increased demand which could only come from the prior protection of the home market. However, government fears of creating monopoly conditions in an industry vital to large sectors of the economy concentrated government on private rationalisation through merger and slimming-down of inefficient plant.⁸⁰ In other words, rationalisation was a prerequisite for protection, and was used as a bargaining counter by government in relations with business. Nevertheless, there was now a clear message for business that they would have

to emulate and face up to "foreign competing firms of larger scale"⁸¹

Such remarks were clearly evident amongst Sheffield businessmen in the 1920's, indeed they had been prevalent before 1914. But now, induced by depression, and faced with the realisation of absolute competitive decline, there were numerous calls for the introduction of mass production techniques, the expansion of scientific research, and the amalgamation of small firms to meet foreign competition. This was put forcefully by the President of the Chamber S.J. Robinson in 1923:

Although our mechanical appliances are much better than they were one or two generations ago, we are not getting the same output per unit of labour and capital that our fathers and grandfathers obtained ... we are living on our capital, not on the capital we have created, but on that which our fathers and grandfathers have created for us.⁸²

Furthermore, picking up on the theme of national unity which had been strong in the Chamber since the war, he argued that if bankers, manufacturers, shippers and workers would "work together with goodwill British trade would surmount all obstacles, and depression would be converted into prosperity."⁸³

The call for reorganisation was clearly demonstrated by a number of articles in relation to the foundry sector of the industry in 1921. Attacks on inefficient organisation, the slow adoption of new techniques, the scarcity of trained manpower, the lack of coordination and planning between the technical departments were amongst a host of complaints levelled at the

industry.⁸⁴ Indeed, these deficiencies in organisation had been noted before 1914. The American Machinist claimed in 1913 that organisation lagged behind the productive techniques operating in Sheffield's foundries, and there was no application of the principles of scientific management defined in terms of the "systematic use of experience", the "economic control of effort", and the "promotion of personal efficiency."⁸⁵ The application of scientific management to foundry production was clearly recognised by the Sheffield Branch of the Cast Iron Research Association in 1921. For example, the President J.R. Hyde claimed that "In England the moulding shop was the last place engineers thought of visiting, whereas in America by their aid they were able to produce quite remarkable castings with unskilled labour". Similarly, J.G. Pearce proclaimed that the use of scientific research in the US foundry was an "economic weapon" which was undermining Sheffield's ability to compete.⁸⁶

The aim of the Research Association was to promote cooperation amongst firms in the area of scientific research, but as Thomas Vickers argued, the small-scale structure of the industry, and the low volume of output in relation to the capital costs of setting up research labs and employing technicians, worked against this principle. Although some large, "more enlightened firms", had introduced scientific principles of research, there were a large number of small foundries "who still conduct their operations without the least

appreciation of scientific principles and are working by rule of thumb." He further argued that the number of labs is "still very small indeed." Thus the industry required a process of amalgamation to allow economies to be realised in research and development.⁸⁷ That such a plea came from a representative of a large firm such as Vickers suggests that the call for the modernisation of scientific research came from the top, but one suspects that it filtered down only slowly to smaller business units. As the Chamber remarked in 1928, in relation to the introduction of mass production on scientific lines, in Sheffield the "adoption proves costly and is necessary slow."⁸⁸

Nevertheless, the depression of 1930 saw a new resurgence of interest in amalgamation in the steel industry in response to the problem of over-capacity. As Burn argues, the 1920's witnessed an over-expansion of steel making capacity which became all too obvious to the industry as falling demand in 1929 led to problems of overproduction.⁸⁹ In 1928, Sheffield's heavy trades experienced an upsurge in overseas demand, but in 1930 the volume of output fell by 25%.⁹⁰ Thus firms were faced with the need to rationalise, introducing more cost effective methods of organisation and production, and the late 1920's witnessed a number of important horizontal mergers in steel in which Vickers played a leading role.⁹¹ Furthermore, a number of large steel firms developed foreign subsidiaries, especially in the USA.⁹² For example, in 1925 Spear & Jackson acquired the ailing Oldham New York Saw Company motivated by the desire to

have a large outlet for the export of their steel and to provide orders on the spot quickly.⁹³

However, businessmen viewed amalgamation and cooperation with a certain degree of scepticism and caution. For example, the Chamber held back on its judgement on the amalgamation of Vickers and Cammell-Laird in 1928 to form the English Steel Company. Although acknowledging the "theoretical" advantages of rationalisation, in terms of scale economies, they argued that the "practical" problems associated with managerial reorganisation rendered "the final result problematic", and they noted their concern over the speculative nature of company formation.⁹⁴ A clear objective in amalgamation and cooperation was attempts to counteract the falling level of demand during the recession. However, this was viewed with some "disquiet" as a defensive, conservative strategy on the part of business. The reorganisation of firms who were already operating at overcapacity implied "a tacit admission that any considerable increase in trade is not likely to materialise for some time." Thus, although the Chamber welcomed a positive reaction to the depression, through merging and rationalising production, this should coincide with a dynamic marketing strategy, and "cooperation is not only required at the production end, but also at the selling end." Furthermore, rationalisation did not provide a quick answer to trade recession, and although rationalisation schemes were undertaken in 1930 the effects of this in terms of reduced costs were staggered.⁹⁵

It is reasonable to suggest that the problems of reorganisation were particularly acute in cutlery, where the retention of an industrial structure overloaded with small-scale producers and relying on a skilled workforce restricted the introduction of mass production techniques. In 1920, the Cutlery Research Association had declared its aim to promote the more extensive use of machinery and the application of mass production techniques on the lines of Germany and the USA.⁹⁶ For some firms this meant the duplication of German techniques. For example, Wostenholme's in 1922 developed links with the electro-chemical works of Frieder, Blasberg and Merscheid, and imported galvanising apparatus. In 1930 they imported German high speed riveting machines and employed a German technical advisor, Henry Beckerman, to install a new nickel plating plant. By 1932 the firm was facing competition from direct foreign investment with the removal of the Solingen firm of Richartz & Co. to Sheffield. Capitalised at £1,000,000, and assisted by English finance, "they offer their goods cheaper than we sell ours."⁹⁷

However, as Pollard suggests, the diffusion of new methods was "uneven" and the Research Association "expired quickly for lack of support." Nevertheless, labour-saving innovations expanded in the 1920's, drop stamps and presses were adopted, electricity utilised in hardening and annealing furnaces, and machine prepared parts were supplied to cutlers, thus speeding up the finishing process. However, this did not fundamentally

change the structural base of the industry, new capital equipment was not expensive, and could be undertaken even by smaller firms, "and the new processes often required as much skill and training as the old."⁹⁸ The survival of small-scale firms was evident as late as 1951, when out of 700 cutlery firms 500 employed less than 11 workers, and only 4 companies employed more than 500.⁹⁹

In 1928 the Chamber remarked that the competitive pressures on the exports of cutlery, tools and light steel products had reached "serious proportions", and in 1929 the continued depression led to calls for "far reaching reorganisation."¹⁰⁰ However, a solution based on mass production and amalgamation was difficult to impose for two reasons. Firstly, the small-scale structure of the industry restricted attempts at amalgamation, and thus it is "doubtful whether mass production can be adopted with advantage." Secondly, a continued belief in the merits of quality and producing for order was an obstacle to mass production techniques which required the manufacture of a standardised item.¹⁰¹ Similar reservations were advanced by the Economist in 1921 concerning the formation of Sheffield Steel Products Ltd., a merger of 19 tool and cutlery producers, who argued that the advantages of scale economies in production were as yet untested.¹⁰² Indeed, recommendations for rationalisation concentrated on marketing economies rather than production economies. As Hannah claims, marketing economies of merger

"were often considered to be the most important economies immediately available."¹⁰³

Thus reorganisation should follow a strategy of joint cooperation in marketing, and changes in the physical resources of production by concentrating on standard selling lines. As the Chamber argued in 1928, producers must conform to lower priced articles and although

by selling such articles, Sheffield makers may claim ... that it would be prejudicial to their name for high quality ... they must seriously consider whether it is not possible so to reorganise their methods of production that they will be in a position to compete.¹⁰⁴

Furthermore, the requirements of joint advertising were seen as a key area of reorganisation. This had been evident as early as 1925 when the Chamber liaised with a number of advertising agents to promote a "Made in Sheffield" campaign on the lines of the gas, concrete, and woollen industries, and they acknowledged the need for closer ties between industry and advertising organisations. This was difficult to implement, however, given the problems of coordinating action by individual firms and the reluctance of businessmen to provide a fund as advocated by the FBI, in 1927. Indeed, the financial costs of implementing a coordinated advertisement scheme was here a major obstacle, and the depletion of profits by 1929 had left firms reluctant to commit funds to an "extensive and costly selling scheme."¹⁰⁵

However, the "harsh lessons" of 1930 gave a boost to attempts to reform the marketing and production base of the

firm.¹⁰⁶ Wostenholme's, for example, had by 1932 decided to revamp their sales techniques in the USA, now routing distribution directly through the mail order houses and chain stores, and reducing product lines to allow production for stock and rapid distribution. However, the emphasis was still here on quality. As their New York agent G.W Davies argued, the recession in the States had purged the distributors of cheaper cutlery lines who had been faced with excess capacity due to a reliance on "quantity merchandising" in the past 5 years. This would now allow an increased demand for quality products based on standard factory lines.¹⁰⁷ However, this was a misplaced optimism, the industry encountering an influx of cheap US and German cutlery throughout the 1930's.

During the 1920's the constraints on industrial development intensified as Sheffield lagged further behind Germany and the USA in terms of the structure of industry and the formation of more effective techniques of production and exchange. The process of rationalisation and reorganisation was limited and seemed to emerge as a response to industrial and competitive decline. Indeed, by 1930 the rhetoric of rationalisation was submerged in the growing problems of recession, balance of payments deficits, and rising unemployment. This reinforced the contradictions of business policy in relation to the state. On the one hand, company taxation should be cut, welfare and work legislation curtailed, and government attacks on inefficient industry and calls for

rationalisation were condemned as a "salve" to the "political consciences of the Labour government." On the other hand, government intervention in the sphere of tariff policy was viewed as the saviour of industry, a prerequisite to boosting profits and providing needy investment for rationalisation. The problems of the depression were associated with factors of "world wide import", high tariffs and dumping which "individual firms alone cannot combat."¹⁰⁸ As the Chamber remarked, in reference to the 1932 General Tariff, in the history of developed economies there comes a time when "private enterprise" alone is unable to "affect a situation which has become national in its extent and effect."¹⁰⁹ Thus Sheffield businessmen retreated into a conservative world where the protection of business interests was the paramount concern.

Notes and References

1. SCL, Records of Sheffield Chamber of Commerce (SCCM), LD1986(9), 23 March 1920.

2. J. Turner, "The Politics of Business", in J. Turner (ed), Businessmen and Politics (1984), p.7. As K. Middlemass, Politics in Industrial Society (1979), p.20, claims, the inter-war years witnessed a growing corporate bias, workers and employers associations being elevated from mere interest groups to governing institutions.

3. SCCM, LD1986(9), 17 March 1919.

4. Telegraph, 25 Feb. 1916.

5. Ibid., 28 Jan. 1916. The emphasis on Colonial preference provides a degree of continuity with the pre-1914 debate.

6. P.P., 1918 (c9071), 13, Report of the Departmental Committee on Iron and Steel After the War, p.29.

7. Telegraph, 28 Jan. 1916. The recommendation of subsidies and loans to key sectors was proposed by a government committee in 1918, P.P. 1918 (c9035), 13, Final Report of the Committee on Commercial and Industrial Policy After the War, pp.46, 49.

8. Telegraph, 28 Jan. 1916.

9. The impact of the war in fostering a protectionist policy by business is emphasised by F. Capie, Depression and Protection (1983), p.63.
10. S. Tolliday, "Tariffs and Steel, 1916-1934: The Politics of Industrial Decline", in Turner (ed), Businessmen, p.53. See also P. Cline, "Winding Down the War Economy: British Plans for Peacetime Recovery, 1916-19", in K. Burk, (ed), War and the State p.159, who claims that the "German problem" influenced reconstruction planning, and the sudden collapse of Germany removed the necessity for sustained state intervention.
11. Telegraph, 28 Jan. 1916. Hughes was supported by three steel producers, W.S. Skelton, P. McGregor and J.C. Ward, who claimed that Sheffield should increasingly specialise to avoid "commercial jealousy."
12. SCCM, LD1986(9), 22 Feb. 1917.
13. Ibid., 5 Feb. 1916
14. Ibid., 9 Oct. 1915. The duty was seen as temporary, for the duration of the war. The Chamber also advocated an immediate removal of trade restrictions. Ibid., 12 Nov. 1917.
15. SCCM, LD1986(10), 22 March 1921. Balfour, a Sheffield steel maker, was Chairman of the Committee on Industry and Trade, bearing his name. which made its final report in 1928.
16. Ibid., 12 Oct. 1920.
17. Capie, Depression, p.66.
18. SCCM, LD1986(10), 22 March 1921.
19. Capie, Depression, p.41.
20. SCL, Records of H. Shaw Magnets, HSM34, Miscellaneous Documents, H. Shaw to Chamber of Commerce, 24 Feb. 1921. According to Balfour, out of nine tungsten producers operating during the war, only two were still in business, and only a few magnet makers were left. SCCM, LD1986(10), 22 March 1921.
21. SCCM, Annual Reports 1920-29, 22 March 1921. The Foundry Trade Jnl., vol.23 (1921), p.70, referred to stagnation in high speed steel, due to high prices, credit restriction, erratic foreign exchanges, and foreign competition.
22. J. Beardshaw & Co., Baltic Steel Works Magazine, vol.2, no.1 (1923), p.38.
23. SCL, Records of Kenyon's, 244/B4/1A, Correspondence Relating to Financial Affairs and Winding Up, 1929-30; 244/B1/1, Minute Book, 10 March 1920; 12 May, 30 Dec. 1924; 25 Sept. 1925.
24. SCCM, 1986(9), 17 March 1919.
25. SCL, Records of Wostenholme's, Wos R9, Canadian Correspondence, A. Macfarlane (Montreal) to W. Nixon, 24 March 1922.
26. Sir Arthur Balfour, A Plain Statement on Governmental Debts, Reparations, Tariff and Gold Standard (1932). The extension of the Safeguarding Act in 1926 was partly concerned with counteracting dumping due to the depreciation of currencies. Capie, Depression, p.41.
27. Tolliday, "Tariffs", pp.53-5.
28. Ibid., pp.53-4.
29. SCCM, LD1986(10), 22 March 1921.
30. Ibid.
31. A policy of "dear money" was introduced in April 1920, Bank Rate rising to 7%. The effects of this are discussed by S. Howson, "The Origins of Dear Money, 1919-20" Econ Hist. Rev., vol.33, no2 (1980), pp. 88-107.

32. SCCM, LD1986(10), 22 March 1921.
33. Ibid., 9 Jan. 1923. 22 Associations in Sheffield sent deputations to MP's urging national economy. Ibid., 29 Nov. 1923.
34. Ibid., 2 May 1922. The armaments debate re-surfaced in the depression of the late 1920's. As the management of Hadfield's commented, naval disarmament, "coming on top of the worst trade depression we have ever known ... has added to our burdens in a most unexpected way." SCL, Records of Hadfield's Ltd., Shareholder's Minute Book no.2, 9 April 1931.
35. Ibid., 22 March 1922.
36. Ibid., 27 March 1923.
37. SCCM, Reports, speech by W.F. Beardshaw, 26 March 1924.
38. D.H. Aldcroft, From Versailles to Wall Street 1919-1929 (1987 edn), pp.47-8.
39. See complaints by R. Hyde & Sons, and Spear & Jackson on high cost of local electricity; complaints on high price of coal and overcharging by railway companies by the General Purposes Committee of the Chamber. SCCM, LD1986(10), 26 July 1922, 29 April 1924. A. Peech, the Chairman of United Steel, argued that future economy in steel production depended on reducing the cost of coal and coke. Foundry Jnl., vol.23 (1921), p.545.
40. SCCM, LD1986(10), 26 Feb. 1924; Reports, 31 March 1927.
41. SCCM, LD1986(10), 2 May 1922; 25 Dec. 1925. A further criticism of the railways was their failure to stimulate domestic demand. Ibid., 29 Nov. 1923.
42. Ibid., 25 March 1923.
43. Ibid., 28 July 1925. For a further discussion on government intervention in these industries see, M. Kirby, The British Coal mining Industry 1870-1946 (1977); P.J. Cain, "Railway Combination and Government 1900-1914", Econ. Hist. Rev., vol.25, no.2 (1972); L. Hannah, Electricity Before Nationalisation (1979).
44. Balfour, Plain Statement, p.15.
45. SCCM, 22 March 1921.
46. Ibid., 24 Oct. 1922. In 1921, Balfour headed a deputation of 3 steel producers, P. McGregor, S. Robinson, and J.C. Ward, to plead Sheffield's case with the Senate Finance Committee, but the tariff was increased on a further two occasions up to 1930. Balfour, Plain Statement, p.7; Foundry Jnl., vol.24 (1921), p.197.
47. Reported in SCCM LD1986(10), 2 Dec. 1924.
48. Ibid., 24 Oct. 1922. The Fordney Tariff was prohibitive except for well known brands.
49. Wos R9, J.C. Wing to F.B. Colver, 13 April 1922.
50. Wos R12(a), Letters Concerning NY Agency, Colver to Newbry Sales Co. (NY), 15 Dec. 1931. As sales fell, they could only maintain turnover "by clearing a lot of slow moving stock at a loss and further stock reductions are necessary." Ibid., Wostenholme's to F. Holroyd (NY Office), 1 March 1932.
51. See Appendix B, Table 6, which shows the squeeze on the firm's profits in the 1920's.
52. Wos R12(b), Financial Accounts, Memo on NY Stocks, 6 Feb. 1931. The proportion of duty on cost price at Sheffield was a staggering 50 %.
53. Wos R12(a), Memo by Colver on US Sales, 24 Feb. 1932.
54. Evidence was given by J.H. Doncaster & C.W. Kayser (High Speed and

Crucible Steel Makers Assoc's.), J.G. Elliot (Cutlery Manufacturers Assoc.), A.S. Pye-Smith (File Manufacturers), D. Flather. (Bright Steel Bar Manufacturers). See summary of evidence, Telegraph, 4 Feb., 24 March 1925.

55. Balfour, Plain Statement, p.14.

56. SCCM, LD1986(10), Research Assoc. to Chamber, 7 Dec. 1920. Research Associations were linked with the Department of Scientific and Industrial Record, and despite underfunding, developed "as pools of research for industry to tap." Middlesmass, Politics, p.180.

57. SCCM, LD1986(10), 7 Dec. 1920. T. Rudd, surgical scissors; A. Coward, razors, C. Williamson, pliers.

58. Baltic Magazine, (1923), p.38.

59. SCCM, Reports, 31 March 1927.

60. SCCM, LD1986(10), 30 Oct. 1923.

61. SCCM, Reports, 29 March 1928; Annual Reports 1930-33, 25 March 1930.

62. Capie, Depression, pp.46, 48-9.

63. SCCM, Reports, 22 March 1921.

64. Foundry Jnl., vol. 23 (1921), pp.22, 282, 230

65. Baltic Magazine (1923), p.38.

66. Private Collection (lent by the firm), Records of W. Birkinshaw, Minute Book, Birkinshaw's to Sheffield Forgers & Tilters Assoc., 23 Dec. 1919.

67. Foundry Jnl., vol.23 (1921), p.416.

68. Ibid., p.138.

69. Ibid., vol.23 (1921), p.464 vol.24, pp.22, 82

70. G. Tweedale, Sheffield Steel and America (1987), p.48.

71. Ibid., pp.47-51. These issues were discussed by the Foundry Jnl., vol.23 (1921), p.217; vol.24 (1921), p.185. See also Edgar Allen News, vol.1, no.3 (1919), p.38, which claimed that the electric process was unproven with regard to quality.

72. Foundry Jnl., vol.23 (1921), p.217; vol.24 (1921), p.185.

73. Ibid., vol.23, p.217.

74. Ibid. This was further exacerbated by the government dumping of 2,000 tons of high speed and crucible steel.

75. Baltic Magazine (1923), p.41; Foundry Jnl., vol.24, p.411.

76. SCL, Records of Beardshaw's, MD7081(6), Minute Book, 6 Oct. 1921.

77. Ibid., MD7081(7), 29 June 1924.

78. Was R9, Wing to Colver, 13, 27 April 1922. The decision by Paine to break with the Association and ignore new price lists was described as "suicidal", and the "relations between the managing director and his co-directors his unsatisfactory ... he should reconsider his position." Wing to Colver, 22 April 1922.

79. MD7081(7), 28 April 1931. SCL, LD1940, Price Lists and Circulars of the Crucible & Tool Steel Assoc.

80. Tolliday, "Tariffs", pp.55-7.

81. L. Hannah, The Rise of the Corporate Economy (1983 edn), p.37.

82. SCCM, LD1986(10), 27 March 1923.

83. Ibid.

84. See speeches to the Sheffield Branch of the Cast Iron Research Assoc., in Foundry Jnl., vol.23 (1921), pp.16-17, 56-8, 86, 123-4, 138.

85. American Machinist, vol.39 (1913), pp.79E-80E.

86. Foundry Jnl., vol.23 (1921), pp.86, 117.

87. Ibid., p.316.
88. SCCM, Reports, 29 March 1928.
89. D. Burn, The Economic History of Steelmaking (1940), p.360. UK steel capacity utilisation fell as low as 30% in 1921 and 1927, and rarely topped 60% throughout the 1920's. S. Tolliday, "Steel and Rationalisation Policies, 1918-1950", in B. Elbaum & W. Lazonick (eds), The Decline of the British Economy (1986), p.86.
90. SCCM, Reports, 26 March 1929, 25 March 1931.
91. S. Pollard, A History of Labour in Sheffield (1959), p.270.
92. Tweedale, Sheffield Steel, p.107.
93. SCL, Records of Spear & Jackson, SJC73, Correspondence with the Oldham NY Saw Works, 1925.
94. SCCM, Reports, 26 March 1929. The issue boom of 1928 produced a number of "spectacular casualties", Hannah, Corporate Economy, p.61.
95. SCCM, Reports, 26 March 1929; 25 March 1930.
96. Ibid., 7 Dec. 1920.
97. Wos R11, Letters and Accounts Concerning Erection of machinery, Frieder & Co. (Solingen) to Wostenholme's, 10 Dec. 1922; H. Kaufman & Sons to Wostenholme's, 9 April 1932.
98. Pollard, Labour, pp.293-5. Mechanisation allowed the increasing employment of women in some trades. Furthermore, it allowed wage reductions. See Wos R9, Colver to Wing, 12 April 1922.
99. H. Townsend, "The Cutlery Trade", in D. Burn (ed), The Structure of British Industry (1953), pp.379-80.
100. SCCM, Reports, 29 March 1928; 26 March 1929.
101. Ibid., 29 March 1928.
102. Economist, (1921), pp.338, 877, 916.
103. Hannah, Corporate Economy, p.36.
104. SCCM, Reports, 29 March 1928.
105. SCCM, LD1986(10), 30 June, 28 July 1925; Reports, 31 March 1927, 26 March 1929.
106. Reports, 25 March 1931.
107. Wos R12(a), G.W. Davis (NY) to Colver, 8 Jan., 14 Feb. 1932.
108. SCCM, Reports, 25 March 1930; 25 March 1931; 23 March 1932, 28 March 1933.
109. Ibid., 23 March 1932.

APPENDICES

Appendix A: Data Relating to the Reconstruction of the Sheffield Iron and Steel Industry 1880-1901.

Table 1: Description of Sheffield Industrial Classifications.

Industry:

B	Basic producers of iron and steel including foundries.
C	Cutlery producers, including pure fabricators and integrated concerns producing both cutlery and basic steel. ^a
TE	Tool and engineering goods producers, including pure fabricators and integrated concerns producing both tools, engineering goods and basic steel.
CT	Cutlery and tool producers combined, including pure fabricators and integrated concerns.

Note: a. This category includes electro-plating firms.

Source: R. Lloyd-Jones and M.J. Lewis, "Industrial Structure and Firm Growth: The Sheffield Iron and Steel Industry, 1880-1901," Bus. Hist., vol.25, no.3 (1983), p.260.

Table 2: Grouping of Firms by RV, Sheffield 1880.

RV (£)	Firm Type				Total
	B	C	TE	CT	
1-50	7	36	25	1	69
51-100	10	24	27	3	64
101-150	11	10	25	3	49
151-200	6	6	12	2	26
201-250	3	5	9	0	17
251-300	4	3	5	2	14
301-350	4	2	3	1	10
351-400	3	2	5	1	11
401-450	1	2	2	0	5
451-500	0	1	7	1	9
501-550	1	1	1	0	3
551-600	2	1	2	0	5
601-700	1	1	3	0	5
701-800	1	0	2	0	3
801-900	0	1	1	0	2
901-1,000	0	1	2	0	3
1,001-1,100	1	0	0	0	1
1,101-1,200	2	0	0	0	2
1,201-1,300	0	0	3	0	3
1,301-1,400	0	0	0	0	0
1,401-1,500	0	0	2	0	2
1,501-+	3	1	12	0	16

Source: Rate Books 1880.

Notes: Three clusters are apparent with the first cut off clearly occurring at RV £150. The subsequent sub-ranges, apart marginally for one, all have values less than half of those attained between RV £151-500; four of the seven sub-ranges have double figure values but for the final cluster RV £501-1,500, no sub-range attains more than half double figure value. Furthermore, the value of the last sub-range in each cluster is not approached by any sub-range in the subsequent cluster.

Table 3: Largest Three and Four Firms by RV and Industry Type 1880.

Industry type	Firm	RV
B	W. Cook & Co. Ltd.	2,743
	Sheffield Forge & Rolling Mills Co.	1,957
	Charlton Iron Works Co. Ltd.	1,596
	Neepsend Rolling Mill Co. Ltd.	1,139
C	Joseph Rodgers & Sons	1,849
	J. Dixon & Sons	928
	George Wostenholmes & Sons	860
	John B. Roberts	630
TE	John Browns & Co. Ltd.	18,749
	Charles Camells & Co. Ltd.	10,844
	Brown, Bailey & Dixon Ltd.	6,893
	Edward Vickers, Sons & Co. Ltd.	6,157
CT	Thomas Turner & Co.	493
	William Jackson	365
	Joseph Fenton & Sons	315
	J. & R. Dodge Ltd.	300

Source: Rate Books 1880.

Table 4: The Large Sheffield Cutlery Firms 1880-1901. (RV £501+)

Firm ^a	RV 1880 (£)	RV 1901 (£)	Employment 1890 ^b (Approx)
Joseph Rodgers & Sons Ltd.	1,849	1,436	2,000
J. Dixon & Sons	928	949	1,000
George Wostenholmes & Sons	860	920	1,000
John B. Roberts	630	Exit	-
Needham, Veale & Tyzack	600	720	-
Unwin & Rodgers Ltd.	530	Exit	-
E.G. Draper	Entry	510	-
William Hutton & Sons	364	750	-
Mappin & Webb	345	900	1,000
Harrison Bros. & Howson	255	845	-
Arthur Lee & Sons	43	881	-

Source: a. Rate Books 1880, 1901.

b. S. Pollard, A History of Labour in Sheffield (1959) p. 132.

Table 5: Biographical History of 1880 Firms by Industry Type, 1880-1901.

Type of Firm	Size category									
	Small		Medium		Large		Giant		Total	
	No	%	No	%	No	%	No	%	No	%
B:										
Survival Firms:										
Static ^a	9	32.1	8	38.1	4	50.0	2	66.7	23	38.3
Mobile ^b :										
Up	4	14.3	5	23.8	0	0.0	0	0.0	9	15.0
Down	0	0.0	1	4.8	0	0.0	0	0.0	1	1.7
All Survival	13	46.4	14	66.7	4	50.0	2	66.7	33	55.0
Exit Firms ^c :	15	53.6	7	33.3	4	50.0	1	33.3	27	45.0
Total	28	100.0	21	100.0	8	100.0	3	100.0	60	100.0
C:										
Survival Firms:										
Static	33	47.1	11	52.4	3	60.0	0	0.0	47	48.5
Mobile:										
Up	11	15.7	4	19.0	0	0.0	0	0.0	15	15.5
Down	0	0.0	1	4.8	0	0.0	1	100.0	2	2.1
All Survival	44	62.8	16	76.2	3	60.0	1	100.0	64	66.0
Exit Firms	26	44.2	5	23.8	2	40.0	0	0.0	33	34.0
Total	70	100.0	21	100.0	5	100.0	1	100.0	97	100.0
TE:										
Survival Firms:										
Static	31	40.2	24	55.8	5	31.25	11	91.7	71	48.0
Mobile:										
Up	16	20.8	7	16.3	5	31.25	0	0.0	28	19.0
Down	0	0.0	3	7.0	2	12.5	1	8.3	6	4.0
All Survival	47	61.0	34	79.1	12	75.0	12	100.0	105	
Exit Firms	30	39.0	9	20.9	4	25.0	0	0.0	43	29.0
Total	77	100.0	43	100.0	16	100.0	12	100.0	148	100.0
CT:										
Survival Firms:										
Static	3	42.8	4	57.1	0	0.0	0	0.0	7	50.0
Mobile:										
Up	1	14.3	2	28.6	0	0.0	0	0.0	3	21.4
Down	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
All Survival	4	57.1	6	85.7	0	0.0	0	0.0	10	71.4
Exit Firms	3	42.9	1	14.3	0	0.0	0	0.0	4	28.6
Total	7	100.0	7	100.0	0	0.0	0	0.0	14	100.0

Notes: a. The number of firms which survived but remained in the same size category, called static firms.

b. The number of firms which moved between size categories, either upwards or downwards, called mobile firms.

c. The number of firms which left the industry, called exit firms. Exit firms are those listed in the 1880 rate book which lose an independent listing by 1901.

Source: Rate Books 1880, 1901.

Table 6: Owner-occupiers and Renting in Sheffield Firms 1880.

Industry Type	Size Category								Total	
	Small		Medium		Large		Giant			
	OC ^a	R ^b	OC	R	OC	R	OC	R	OC	R
	No	No	No	No	No	No	No	No	No	No
B	12	16	16	5	6	2	3	0	37	23
C	30	40	16	5	4	1	1	0	51	46
TE	34	43	31	12	14	2	12	0	91	57
CT	3	4	6	1	0	0	0	0	9	5
Total	79	103	69	23	24	5	16	0	188	131

% Distribution by Size Category

	%	%	%	%	%	%	%	%	%	%
B	42.8	57.2	76.2	24.6	75.0	25.0	100.0	0.0	61.7	33.3
C	42.9	57.1	76.2	24.6	80.0	20.0	100.0	0.0	52.6	48.4
TE	44.1	55.9	72.1	27.9	87.5	12.5	100.0	0.0	61.5	38.5
CT	42.9	57.1	85.7	14.3	0.0	0.0	0.0	0.0	64.3	35.7
All	43.4	56.6	75.0	25.0	82.8	17.2	100.0	0.0	58.9	41.1

Notes: a. OC relates to firms who are recorded in the rate books as both owning and occupying property.
b. R relates to those firms who occupied property but did not own it, the premises being rented.

Source: Rate Books 1880.

Table 7: Profile of Giant Firms,^a Sheffield 1880 and 1901.

Firm	Industry Type	RV 1880 (£)	RV 1901 (£)	% change
John Brown & Co. Ltd.	TE	18,749	23,316	+ 24.4
Charles Cammell & Co. Ltd.	TE	10,844	23,940	+120.8
Brown, Bailey & Dixon Ltd.	TE	6,893	5,325	- 22.7
Edward Vickers Sons & Co. Ltd.	TE	6,157	28,002	+354.8
Thomas Firths & Sons.	TE	5,551	10,097	+ 81.9
Thomas Turton & Sons	TE	2,907	2,667	- 8.3
William Jessop & Sons Ltd.	TE	2,212	3,249	+ 46.9
Sanderson Bros. & Co. Ltd.	TE	2,070	2,850	+ 37.7
Davey Bros. & Co. Ltd.	TE	1,992	2,479	+ 24.4
Bury & Co. Ltd.	TE	1,778	1,495	- 15.9
Willson, Hawksworth, Ellison & Co. Ltd.	TE	1,690	1,850	+ 9.5
Samuel Osborne & Co.	TE	1,594	2,903	+ 82.1
J.H. Andrew & Son	TE	1,500	2,386	+ 59.1

Craven Bros. & Co.	TE	1,240	2,250	+ 81.4
Ibbotson Bros. & Co.	TE	1,240	1,938	+ 56.3
Hallamshire Steel and File Co. Ltd.	TE	1,113	1,807	+ 62.3
Henry Bessemer & Co.	TE	970	2,193	+126.1
W. Cooke & Co. Ltd.	B	2,747	1,925	- 29.9
Sheffield Forge and Rolling Mills Co. Ltd.	B	1,957	1,524	- 22.1
Joseph Rodgers & Co. Ltd.	C	1,849	1,436	- 22.3

Notes: a. The Charlton Iron Works Co. Ltd. (Industry B. RV 1880, £1,596), was excluded as the firm exited the industry c.1880-1901.

Source: Rate Books 1880, 1901.

Table 8: Company Records of Sheffield Firms and their Status.

Firm	Industry Type	RV 1901 (£)	Status
J.Kenyon & Co.	TE		Trusteeship, converted to private limited liability co. in 1910.
Joseph Beardshaw & Co	TE		Family partnership, converted to private limited liability in 1894.
Cooper Bros & Co.	C		Family Partnership, converted to private limited liability in 1895.
Marsh Bros. & Co.	TE		Family Partnership.
Needham, Veale & Tyzack	C		Partnership, converted to private limited company in 1894.
Spear & Jackson	TE		Partnership, converted to private limited liability in 1905.
Edgar Allen & Co.	TE		Family partnership, converted to private limited liability in 1907.
Burgon & Ball	TE		Family partnership, converted to public limited liability, 1898.
George Wostenholmes	C		Family partnership / trusteeship, converted to private limited in 1875.

Appendix B: Data Relating to Company Profits and Exports.

Table 1: Cutlery Exports to the USA Invoiced Through the US Consulate 1868-1910.

Year Ending	(£000)	Year Ending	(£000)
Sept.30 1868	574	Dec.31 1890	228
Dec.31 1869	284	..... 1891	113
..... 1870	N/D	..... 1892	124
..... 1871	N/D	Sept.30 1893	119
Sept.30 1872	350	..... 1894	81
..... 1873	N/D	..... 1895	148
..... 1874	226	..... 1896	136
..... 1875	191	June 30 1897	159
..... 1876	132	..... 1898	61
..... 1877	141	..... 1899	76
..... 1878	156	..... 1900	95
..... 1879	161	..... 1901	93
..... 1880	N/D	..... 1902	75
..... 1881	N/D	..... 1903	N/D
Dec.31 1882	246	..... 1904	N/D
..... 1883	242	Dec.31 1905	78
..... 1884	170	..... 1906	85
..... 1885	147	..... 1907	N/D
..... 1886	176	..... 1908	56
..... 1887	206	..... 1909	64
..... 1888	210	..... 1910	58
..... 1889	226		

Source: G.I.H. Lloyd, The Cutlery Trades: An Historical Essay in the Economics of Small-Scale Production (1913), p.482

Table 2: Gross Profits Arising from UK Ironworks Assessed to Income Tax 1870-1884

Year	(£Million)	Year	(£Million)
1870	2.0	1878	2.3
1871	2.7	1879	1.9
1872	3.1	1880	1.7
1873	4.8	1881	2.2
1874	7.2	1882	2.9
1875	7.3	1883	3.0
1876	3.9	1884	3.0
1877	2.8		

Source: P.P., 1886 (c4621), 21, First Report of the Royal Commission on the Depression of Trade and Industry, p.218

Table 3: Sheffield Limited Liability Companies 1886: Capital Valuation and RVs

Firm	RV	Called UP Capital		Present Capital		Increase £	Decrease £
	£	Per Share	Total	Per Share	Total		
		d	£	d	£		
J. Brown & Co.	18,749	76	760,000	63	630,000	-	130,000
C. Cammell & Co.	10,844	80	800,000	75	750,000	-	50,000
Wm. Cooke & Co.	2,747	45	147,000	4	14,000	-	123,000
Cocker Bros. & Co.	690	80 & 60	41,000	28 & 29	20,450	-	20,550
Davy Bros.	1,992	22½	67,500	20	60,000	-	7,500
Hallamshire Steel & File Co.	1,884	15	45,000	15	45,000	-	-
Hawksworth, Eyre & Co.	112	6	6,000	2½	2,500	-	3,500
Wm. Jessop & Sons	2,502	30	240,000	25	200,000	-	40,000
Kellham Rolling Mills	791	4	40,000	2½	22,500	-	17,500
Neepsend Rolling Mills Co.	1,139	7½	18,750	4½	11,250	-	7,500
S. Newbold & Co.	267	80	44,960	70	38,340	-	6,620
J. Rodgers & Son	1,849	100	130,000	243	315,000	185,900	-
J. Round & Son	231	6	30,000	9½	46,250	16,250	-
Sanderson Bros.	2,070	80	60,000	60	45,000	-	15,000
Sheffield Forge & Rolling Mill	1,957	10	75,000	2½	18,750	-	55,250
Tinsley Rolling Mills	390	6	9,000	4½	6,750	-	2,250
Vickers, Sons & Co.	6,157	100	750,000	212	1,590,000	840,000	-
Wheatman & Smith	461	108 & ½	50,107	208 & 10½	50,107	21,357	-

Source: Sheffield Daily Telegraph, 26 Dec. 1886.

Table 4: Net Profit and loss, Cooper Bros & Co. 1889-1922.

Year	Net Profit £	Year	Net Profit £
1889	3,878	1906	2,032
1890	3,576	1907	1,097
1891	4,356	1908	-140
1892	3,156	1909	1,405
1893	2,103	1910	3,262
1894	4,681	1911	4,730
1895	N/A	1912	6,178
1896	3,278	1913	5,347
1897	3,122	1914	4,512
1898	3,162	1915	5,126
1899	4,037	1916	7,560
1900	1,803	1917	4,865
1901	3,692	1918	3,692
1902	1,971	1919	10,942
1903	1,965	1920	4,616
1904	1,234	1921	-1,958
1905	1,741	1922	3,864

Note: The firm produced cutlery and electro plated goods.

Source: SCL, Records of Cooper Bros, 499/B1/9, Private Ledger.

Table 5: Net Profit and Loss and Rate of Dividend, Ibbotson Bros & Co. Ltd.
1872-1911

Year	Net Profit £	% Dividend	Year	Net Profit £	% Dividend
1872	10,294	10	1892	- 3,575	0
1873	9,753	10	1893	- 516	0
1874	8,967	10	1894	222	0
1875	11,387	10	1895	5,065	0
1876	10,889	10	1896	12,448	0
1877	4,232	5	1897	10,822	0
1878	8,281	7½	1898	11,553	7½
1879	7,149	7½	1899	12,433	7½
1880	5,807	7	1900	18,678	7½
1881	4,926	5	1901	18,397	7½
1882	7,075	6½	1902	18,960	7½
1883	9,441	7½	1903	16,900	7½
1884	9,038	7½	1904	18,282	7½
1885	9,518	7½	1905	17,842	7½
1886	10,000	7½	1906	19,691	7½
1887	10,036	10	1907	20,093	7½
1888	4,194	5	1908	19,766	7½
1889	7,089	7½	1909	23,155	10
1890	7,846	7½	1910	22,964	10
1891	2,790	5	1911	21,551	10

Note: The firm produced steel, engineering goods and tools.

Source: SCL, Records of Ibbotson Bros, LD1146, Private Ledgers.

Table 6: Trade Profit and Loss, Wostenholme's, 1881-1934

Year	Profit £	Year	Profit £
1881	17,522	1908	6,901
1882	18,867	1909	7,214
1883	18,873	1910	10,139
1884	16,919	1911	11,747
1885	7,683	1912	10,251
1886	14,971	1913	9,332
1887	13,106	1914	11,475
1888	13,617	1915	10,279
1889	16,320	1916	10,153
1890	13,869	1917	10,778
1891	6,353	1918	8,128
1892	5,138	1919	6,977
1893	4,279	1920	8,953
1894	316	1921	8,782
1895	9,571	1922	-1,098
1896	8,502	1923	-2,125
1897	8,753	1924	1,214
1898	1,560	1925	- 740
1899	3,198	1926	- 248
1900	4,913	1927	1,288

1901	4,223	1928	2,257
1902	4,559	1929	1,702
1903	6,311	1930	- 2,306
1904	5,593	1931	- 2,096
1905	5,760	1932	- 2,807
1906	6,953	1933	- 257
1907	9,569	1934	2,911

Source: SCL, Records of Wostenholmes, Wos R145, Private Ledger.

Appendix C: Data for Wages and Sub-occupancy

Table 1: Index of Money Earnings in the Sheffield Trades^a 1868-1896
(1900 = 100)

Year	Money Earnings	Year	Money Earnings
1868	79	1883	92
1869	81	1884	82
1870	86	1885	77
1871	97	1886	73
1872	102	1887	77
1873	101	1888	80
1874	93	1889	90
1875	86	1890	92
1876	82	1891	91
1877	83	1892	82
1878	80	1893	78
1879	78	1894	81
1880	82	1895	85
1881	86	1896	93
1882	93		

Note: a. Includes both light and heavy trades.

Source: S. Pollard, A History of Labour in Sheffield (1959), pp.339-40.

Table 2: Approximate Total Value of Output of Sub-Occupiers of Tenement
Factories in Sheffield and District, 1907

Cutlery Products	Value(£)	Tools and Implements ^a	Value(£)
Steel Cutlery	105,000	Agricultural	2,000
Electro-plated Goods	21,000	Files & Rasps	32,000
Other Products	4,000	Saws & Machine Knives	9,000
		Edge Tools	34,000
Total of Goods Made for Sale	130,000	Engineers Tools	2,000
		Other Sorts	12,000
		Other Products	2,000
Work Done On:			
Cutlery	119,000	Total of Goods Made for Sale	93,000
Electro-plated Goods	10,000	Total Value of Work Done for the Trade on Materials supplied	63,000
Other Products	1,000		
Total Value of Work Done for the Trade on Materials Supplied	130,000	Total Value	156,000
Total Value	260,000		

Notes: a. includes parts of and repairs.

Source: P.P. (1907), Census of Production, pp. 20, 22.

Appendix D: Business and Tariff Reform, Sheffield 1904-05.

Table 1: Voting Patterns of Members of the Sheffield Chamber: Tariff Meeting March 1905.

Individual	Firm	Business	Vote ^a
1 H.H. Bedford	John Bedford & Sons	Steel & Tools	Y
2 Sir John Bingham	Walker & Hall	Electro Plate & Outlery	Y
3 W.F. Beardshaw	Joseph Beardshaw & Son	Steel & Tools	Y
4 J. Dixon	J. Dixon and Sons	Electro Plate & Outlery	Y
5 F. Brittain	S.S. Brittain	Steel & Tools	Y
6 B. Brittain	S.S. Brittain	Steel & Tools	Y
7 Brailsford	Ebbw Vale Steel Co.	Steel	Y
8 W.H. Brittain	William Hall	Steel & Tools	Y
9 H.Y. Marsh	Marsh Bros.	Steel & Tools	Y
10 W. Beckett	A. Beckett & Sons	Steel & Tools	Y
11 P. Macgregor	Sanderson Bros. & Newbould	Steel & Tools	Y
12 W.T. Beesley	W.T. Beesley & Co.	Steel, Wire and Castings	Y
13 S.J. Robinson	S.J. Robinson & Co.	Coal Merchants	Y
14 Arthur Balfour	Seeborn & Dieckstahl/ A. Balfour & Co.	Steel & Engineering	Y
15 Col. Watson	Seeborn & Dieckstahl	Steel & Engineering	Y
16 W.F. Osborne	S. Osborne & Co.	Steel & Tools	Y
17 George Senior	G. Senior & Son	Heavy Steel Forgings	Y
18 Albert Senior	G. Senior & Son	Heavy Steel Forgings	Y
19 J.H. Hibbard	S. Hibbard & Son	Electro Plate & Outlery	Y
20 C.H. Gilbert Hay	Hay & Son	Wine & Spirit Merchants	Y
21 J.K. Baker	J. Baker & Sons	Steel & Tools	Y
22 W. Colver	Jonas & Colver	Steel & Tools	Y
23 Joseph Jonas	Jonas & Colver	Steel & Tools	Y
24 W.T. Turner	Thomas Turner & Co.	Steel, Tools & Outlery	Y
25 Thomas Harrison	W.W. Harrison & Co.	Electro Plate & Outlery	Y
26 R. Belfitt	G. Butler & Co.	Electro Plate & Outlery	Y
27 C.W. Kayser	Kayser, Ellison & Co.	Heavy Steel & Engineering	Y
28 A.J. Hobson	R. Hornsby & Son/ W. Jessop & Son/Savoy & Co.	Outlery, Steel & Tools	N
29 H. Hughes	Hughes & Co.	Accountant	N
30 Sir C. Skelton	C.T. Skelton & Co.	Tools	N
31 Alderman W.J. Clegg	Clegg & Sons	Solicitors	N
32 J. Jackman	J. Jackman & Co.	Steel & Tools	N
33 W. Chesterman	J. Chesterman & Co.	Engineering Tools	N
34 J. Derry	Sheffield Independent	Editor	N
35 S.E. Howell	S.E. Howell & Co.	Steel & Tools	N
36 C.D. Pettinger	S. Laycock & Sons	Railway Equipment (Government)	N
37 R.G. Holland	Holland & Co.	Iron & Steel Merchants	N
38 E.M. Gibbs	E.M. Gibbs	Accountant	N
39 C.E. Pearson	F.G. Pearson & Co.	Steel & Tools	N
40 J.J. Hounsfield	N/A	N/A	N
41 J. Appleyard	Appleyard & Co.	Furniture Manufacturers	N
42 J.W. Best	J.W. Best	Accountant	N
43 R.P. Richardson	R.P. Richardson	Solicitor	N
44 G.H. Mellor	G.H. Mellor	Estate Agent	N
45 E. Priestman	Singleton & Priestman	Outlery Manufacturers	N
46 W.L. Thompson	W. Spencer & Co.	Steel & Tools	N

Notes: a. The vote was for or against the introduction of a retaliatory tariff.
Source: Independent, 5 March 1904; Directory, 1904.

Table 2: Members of the Sheffield Tariff Reform League 1904

Individual	Firm	Business
Sir John Bingham	Walker & Hall	Electro Plate & Cutlery
J. Dixon	J. Dixon and Sons	Electro Plate & Cutlery
J.W. Dixon	J. Dixon and Sons	Electro Plate & Cutlery
W.F. Beardshaw	Joseph Beardshaw & Son	Steel & Tools
F. Brittain	S.S Brittain	Steel & Tools
B. Brittain	S.S Brittain	Steel & Tools
J. Brailsford	Ebbw Vale Steel Co.	Steel
W.H. Brittain	William Hall	Steel & Tools
P. Macgregor	Sanderson Bros. & Newbould	Steel & Tools
S.J. Robinson	S.J. Robinson & Co.	Coal Merchants
George Senior	G. Senior & Son	Heavy Steel Forgings
Albert Senior	G. Senior & Son	Heavy Steel Forgings
J.H. Hibbard	S. Hibbard & Son	Electro Plate & Cutlery
C.H. Gilbert Hay	Hay & Son	Wine & Spirit Merchants
R. Belfitt	G. Butler & Co.	Electro Plate & Cutlery
Earl Fitzwilliam	-	-
Earl of Wharncliffe	-	-
Col. C. Allen	Allen & Darwin	Electro Plate & Cutlery
E.L.W. Bellhouse	N/A	N/A
E. Dickson	Dickson Bros & H. Rossell.	Steel & Tools
B.A. Firth	T. Firth & Sons	Heavy Steel & Engineering
J. Shaw	J. Shaw Ltd.	Wire Manufacturers
C.E. Siddall	Sheffield Forge & Rolling Mills	Steel & Forgings
T.W. Ward	T. Ward Ltd.	Heavy Steel & Engineering
W.T. Bescoby	A.T. Bescoby & Son	Paper Manufacturers
George Clarke	J. Clarke & Sons	Cutlery
A. Craven	Cravens Ltd.	Railway Equipment
Ald. T.R. Gainsford	Sheffield Coal Co. Ltd.	Coal
J.J. Greaves	F. Greaves & Sons	Cutlery
Major Hutchings	N/A	N/A
George Hall	C. & J. Hall	Steel & Tools & Engineers
F. Huntsman	B. Huntsman & Co.	Steel
S. Levick	Levick, Swift & Co.	Steel & Tools
C.D. Leng	Sheffield Telegraph	Newspaper Proprietor
S. Roberts	-	M.P.
J. Ridge	J. Round & Sons	Engineering
J. Rhodes	Rhodes & Co.	Coal Merchants
P. Smith	N/A	N/A
H. Sharpe	R.H. Sharpe & Son	Coal Merchants
Howard Vincent	-	M.P.
H. Wilkins	Martin, Hall & Co.	Electro plate & Cutlery
A. Muir Wilson	A. M. Wilson	Accountant
T. Wilkinson	T. Wilkinson	Solicitor
S.H. Ward	S.H. Ward	Brewers
C. Clifford	C. Clifford	Jornalist-Telegraph

Source: Sheffield Year Book and Record (1905), p.349; Directory, 1905.

Appendix E: Data Relating to the War Time Operations of Spear & Jackson Ltd.

Table 1: Monthly Employment of Workers and Hours Worked Overtime in 1916.

Month	Number of Workers		Normal Hours (per week)		Number Working Overtime					
	M ^a	F ^b	M	F	M	Hrs	Total	F	Hrs	Total
Feb.	361	63	52	-	252	12	3,024	-	-	-
March	381	62	50	50	243	15½	3,766	24	14	336
April	378	63	50	49	243	15½	3,766	30	14	420
May	376	63	50	49	240	15½	3,720	24	14	336
June	381	56	50	49	209	10	2,090	15	6	90
July	384	56	50	49	195	10	1,950	15	6	90
Aug.	384	55	50	49	207	12	2,484	15	6	90
Sep.	383	55	50	49	208	15	3,120	16	6	96
Oct.	382	57	50	49	216	14	3,024	8	6	48
Nov.	389	68	50	48	147	12½	1,837	10	6	60
Dec.	391	69	50	48	131	12	1,572	22	6	132

Notes: a. Male workers.
b. Female workers.

Source: S.C.L., Records of Spear & Jackson Ltd., SJC 70, Papers in Connection with the Limitation of Profits on Controlled Establishments Under the Munitions of War Act, Returns made to the Ministry of Munitions, 19 Jan.1917

Table 2: Frequency of Sunday Working 1916

Month	No. of Times Worked	No. of Workers
July-Aug.	5	5
Sep.	3	5
Oct.	4	8
Nov.	5	46
Dec.	4	48

Source: Ibid.

Table 3: Number of Nights Engines Were Working Overtime 1912-13 and 1915.

Date	Number of Nights
Jan.-Dec. 1912	119
Jan.-Dec. 1913	16
Jan.-Dec. 1915	164

Source: SJC 70, Memorandum, 12 March 1917.

Table 4: Output of Steel Shovels 1912-15

Year	Output (doz.)
1912	4,172
1913	4,013
1912-13 (Standard Output)	4,092
1915	6,419

Source: SJC 70, Departmental Note to Invoice Clerks, 30 Aug. 1917.

Table 5: Production of High Speed and Tool and Alloy Steels 1912-16.

high speed steel	1912			1913			1915		
	T	Cwt	Qts	T	Cwt	Qts	T	Cwt	Qts
High Speed Steel	5	11	0	8	4	2	314	8	0
Tool & Alloy Steels	266	14	0	298	1	3	63	13	3
Total	272	5	0	306	6	1	378	1	3

Source: SJC 70, Memorandum, 31 Dec. 1916.

Table 6: Number of Workers Employed on Machinery in 1917

Works Dep't	Unskilled	Skilled
A	2	25
B	0	17
C	24	32
D	14	18
E	0	59
F	6	11
Total	46	162

Notes: Dep't A and B: steel production; Dep't C: shovel, spades, forks and garden tool production; Dep't D: light and heavy edge tools production; Dep't E: saw production; Dep't F: File production.

Source: SJC 70, Memorandums to Head of Departments Enquiring Into the Numbers of Workers Employed in 1915 on Machinery; SJC 71, Papers Relating to a Proposed Edge Tool Amalgamation 1917-20, Draft Memorandum, 1917.

Appendix F: Shipments, Sales, stock and Profit and Loss of Wostenholme's
New York Office 1926-30

Date	Shipments From Sheffield	US Sales	Gross Profit	Expenses	net Loss	Stock
	\$	\$	\$	\$	\$	\$
1926	32,848	88,411	20,375	20,623	247	46,719
1927	29,669	78,900	17,137	17,446	308	44,085
1928	30,128	80,755	16,723	17,747	1,024	39,992
1929	27,351	70,647	15,316	17,701	2,385	38,992
1930	9,234	36,127	6,686	14,487	7,800	28,053

Source: Wos R 12(b), Miscellaneous Financial Accounts on the New York Office 1930.

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Attercliffe, A/1879-80/ A1-1, A1-2; A/1900-01/ A1-1, A1-2
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